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New and Improved: Our IBG Events

Here's a heads-up for anyone thinking of attending any of *WatchTime*'s "Inside Basel/Geneva" events this year. Sign up soon! As I write this in early June, more than three months before the first event, tickets are selling well. For example, more than 100 people have already purchased tickets for the New York City event on Sept. 20. The New York event always sells out, but this year sales are brisker than usual.

There are literally hundreds of excellent reasons not to miss an Inside Basel/Geneva (IBG) event: namely, the hundreds of new watches from the world's top watch companies that are on display for you to behold and hold. But this year, there are a few more good reasons to join your fellow aficionados at one of our five events. That's because Jeff Kingston, the well-known watch expert who is the star of the shows, and Dominik Grau, *WatchTime*'s publisher, who organizes them, sat down at the end of last year's show cycle and critically reviewed them. They decided to make some improvements in the events for 2012, our seventh show season.

The first major change was to upgrade the event venues. The shows will be held over a four-week period starting in Chicago on Sept. 11 and ending in Los Angeles on Oct. 4. In between we'll be in Philadelphia (Sept. 18), New York (Sept. 20), and San Francisco (Oct. 2). The Chicago, New York, San Francisco and Los Angeles events will be in new locations, all of them renowned five-star hotels or private clubs.

The event consists of two parts. It begins with a two-hour watch fair cum cocktail reception at which around 20 watch brands show their latest creations. Following that is a dinner at which Kingston offers a multi-media presentation of the top watches at the SIHH and Baselworld shows. There will be improvements to the cocktail reception, the dinner, and the presentation. The reception will feature live music. Kingston, a self-confessed foodie, will work with the head chef at each hotel to design the dinner menus specifically for the IBG event. The menus will be created solely for IBG and will not be available anywhere else. Wines, too, will get special attention, with Kingston and the hotel's sommelier picking Champagnes and wines that best complement the meal.

There will also be changes in Kingston's presentation. He has revised the format to make it shorter, 75 minutes instead of the 90-minute-plus presentations of previous years. That's because he has altered the video portion of the program. Instead of various watch company executives talking about their watches, the videos will be short mini-documentaries shot in the Vallée de Joux and La Chaux-de-Fonds showing Kingston exploring different aspects of Swiss watchmaking. One features Kingston talking about watchmaking with Philippe Dufour, one of the world's most celebrated watchmakers.

Another change is that Kingston will present the new watches by product category rather than by brand as in previous years. New, too, will be an interactive segment in the presentation with a discussion of the current watch scene between Kingston and yours truly. (Jimmy Durante was right: Everybody wants to get into the act!)

One thing will not change, however: the goodie bags! At the end of the evening, each attendee will receive a bag containing gifts from the watch-company sponsors. We did not dare tamper with this tradition.

To register for an IBG event, go to our website at watchtime.com and click on "Events." Or call 1-800-596-5898. For questions about the events, please email event manager Rose Alonzo at ralonzo@watchtime.com.

I'll be at all the events. If you see me, please say hello. It is always a treat for me to meet our readers.

Joe Thompson
Editor-in-Chief

The scene at last year's IBG New York event

Jeff Kingston (center) talks watches with attendees at the New York IBG.

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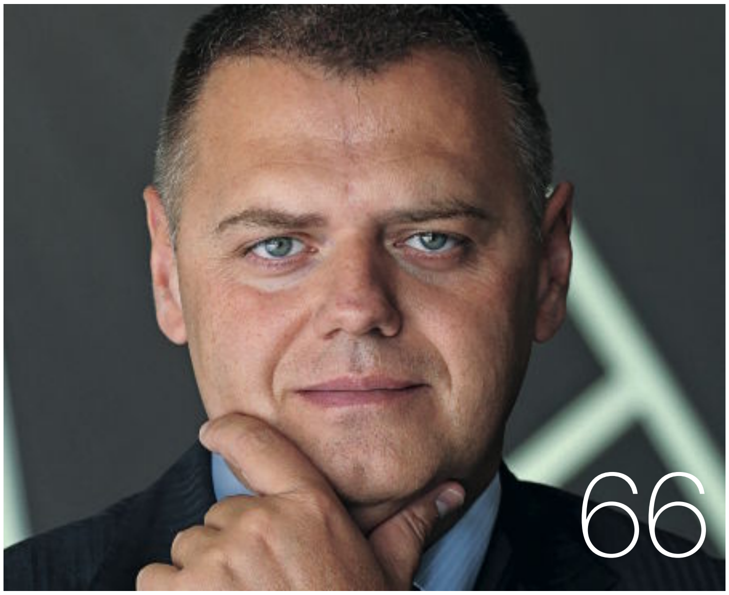

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ULYSSE NARDIN BUYS EBEL'S CHRONO MOVEMENT
In a deal that made the watch industry take notice, Ulysse Nardin purchased from Ebel the rights to the latter's Caliber 137 chronograph movement. UN CEO Patrik Hoffmann spoke to WatchTime.com about the story behind the acquisition and the Ebel movement's historical connection to Ulysse Nardin.

WATCH TO WATCH: BLANCPAIN VILLERET TRADITIONAL CHINESE CALENDAR
There are lots of calendar watches out there, but only one that marks the passage of time using the zodiac signs, celestial stems, five elements, the lunar cycle, and other elements of the ancient Chinese calendar. The watch is new from Blancpain's *haut-de-gamme* Villeret collection. We explain how it works.

VIDEO: CHOPARD'S KARL-FRIEDRICH SCHEUFELE
In an exclusive video interview conducted at Baselworld by *WatchTime*'s German sister magazine *Chronos*, Chopard's president speaks about the brand's new watches for 2012 and its bold initiatives to produce more movements and components in-house.

CABLE MEETS COBRA: DAVID YURMAN'S NEW SHELBY 1000 WATCH
Jewelry and watch company David Yurman has teamed up with legendary car designer Carroll Shelby to create a new timepiece that celebrates the anniversary of Shelby's company and coincides with the launch of the 2012 Shelby automobile. We have specs for the watch and photos of both watch and car.

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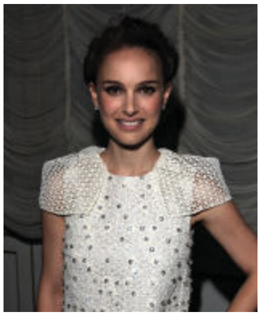
THE BIG REVEAL: MAÎTRES DU TEMPS CHAPTER III
The latest timepiece from Maîtres du Temps unites master watchmakers Kari Voutilainen and Andreas Strehler and features the very first Maîtres du Temps *manufacture* movement. Called the Chapter III Reveal, its highlight functions are its rollers for the month and moon-phase, hidden behind sliding panels on the dial.

CELEBRITY WRIST WATCH
What watch was Samuel L. Jackson sporting in "The Avengers"? Which brands will Natalie Portman and Diane Kruger be partnering with to produce new watches? Which timepiece will Usain Bolt be using to time his laps for the London 2012 games? Check out our celebrity features, and new *WatchTime* blog, for the latest on sightings and endorsement deals.



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Newsstand Circulation	Ralph Perricelli and Irwin Billman MCC

WatchTime (ISSN 1531-5290) is published bimonthly for $49.97 per year by Ebner Publishing International, Inc., 274 Madison Avenue, Suite 804, New York, NY 10016. Copyright Ebner Publishing International, Inc. All Rights Reserved. July/August 2012 issue, Volume 14, Number 4. POSTMASTER: Send address changes to WatchTime, WatchTime Subscription Service, P.O. Box 3000, Denville, NJ 07834-3000, Tel. 1-888-289-0038. Publications mail agreement no. 40676078: Return undeliverable Canadian addresses to P.O. Box 503, RPO West Beaver Creek, Richmond Hill, Ontario L4B 4R6.

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Hoop Dreams

How a child's toy solved Montblanc's millisecond challenge

If three watches constitute a trend, then measuring milliseconds, or 1/1,000s of a second, is a trend. Two watch brands, each with high-speed horological histories, have launched mechanical chronographs claimed to be capable of accurately measuring 1/1,000s of a second. Last year, TAG Heuer debuted its Mikrotimer Flying 1000 Concept Chronograph, followed this year by the even faster Mikrogirder. At SIHH this year, Montblanc launched its own millisecond-measuring marvel, the TimeWriter II Chronograph Bi-Fréquence 1000, which employs a unique approach to splitting seconds.

In a sense, development of Montblanc's high-speed chronograph began in 1916. That's when Minerva launched its first 1/100s-of-a-second stopwatch. Acquired by Richemont in 2006, Minerva was a true *manufacture*, known for chronographs and pilots' watches. In 2007, Richemont decided that Minerva would produce movements for Montblanc, and the following year, Montblanc launched the "Fondation Minerva" to create the TimeWriter series, consisting of extraordinary timepieces developed with independent watchmakers. The first piece in the series – Metamorphosis – was launched in 2010. The newest piece, the Bi-Fréquence 1000, is the latest TimeWriter creation.

The movement is a clean-sheet-of-paper design.

Because of Minerva's long experience producing high-speed chronographs, Montblanc recognized that constructing a chronograph capable of measuring 1/1,000s of a second over a useful interval presented four challenges:

1. The movement must be precise, and simply increasing the frequency of the balance wheel would not work, because engaging the chronograph would cause a significant loss of amplitude, reducing precision.

2. A gear train that advanced 1,000 times per second would be subjected to wear and tear that would reduce the movement's longevity.

3. The chronograph indications must be legible. Measuring to the nearest 1/1,000s of a second means nothing if the elapsed time to the third decimal cannot be easily read.

4. The chronograph must be useable in the real world, meaning it must be able to measure intervals longer than just a few minutes.

To meet these challenges, Montblanc teamed up with independent watchmaker Bartomeu Gomila, who had an ingenious

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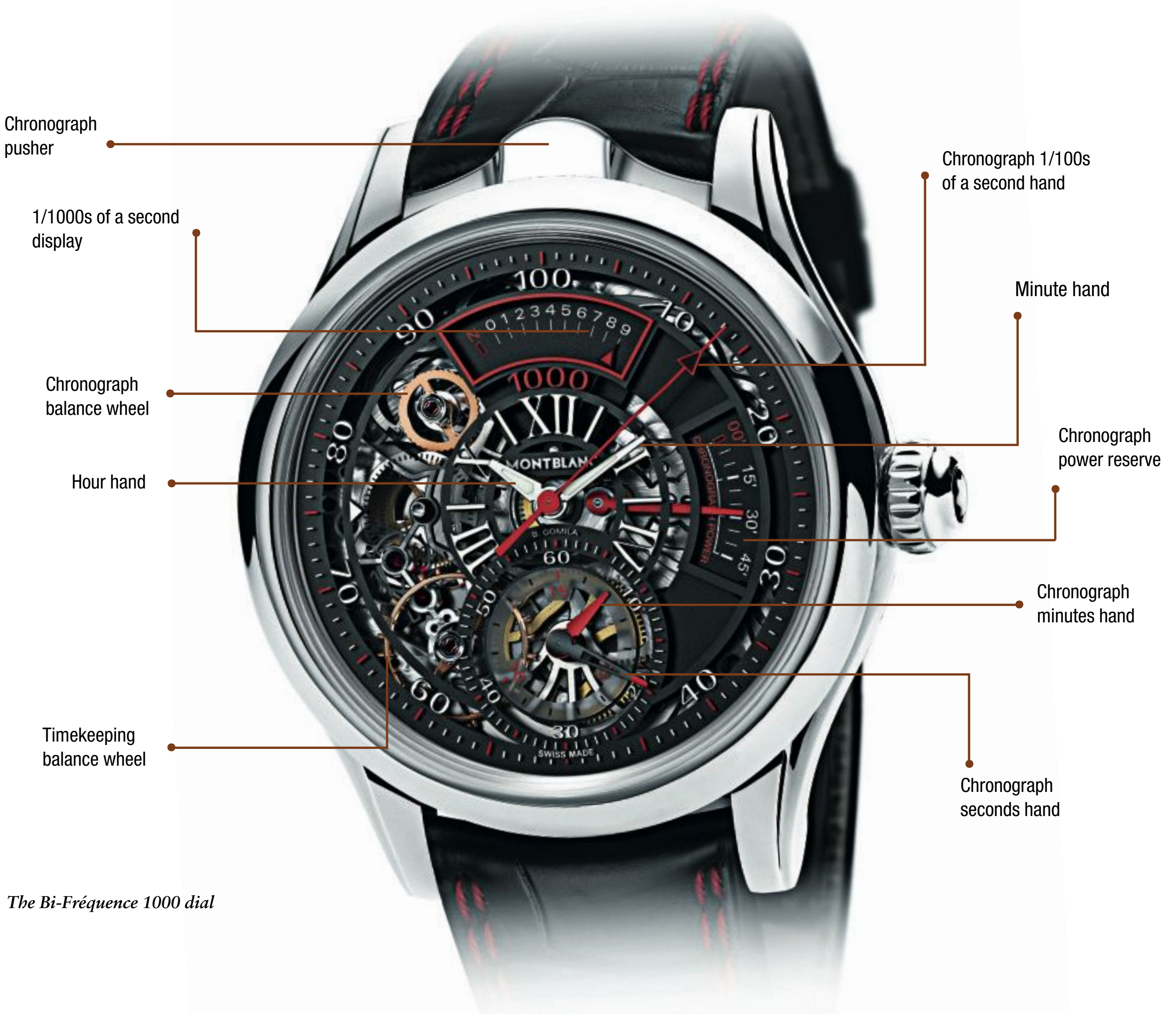
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The Bi-Fréquence 1000 dial

idea for measuring 1/1,000s of a second. Gomila's concept was based on a childhood toy – a simple hoop kept rolling with regular taps from a stick. The result is a chronograph with a unique system for splitting seconds into ever-smaller units, and an unusual way of displaying those units.

Any discussion of the Bi-Fréquence must begin with an overview of the dial layout. At first glance, an observer might note that Montblanc has failed to satisfy its self-imposed legibility requirement. In an interview, Montblanc's managing director of watches, Alexander Schmiedt, acknowledged that the Bi-Fréquence is "not an easy watch." However, as we learned firsthand, a brief orientation yields an understanding of, and even an appreciation for, the dial's clarity.

As shown in the image above, the time of day is displayed by the small, white, center-mounted hour and minute hands. The chronograph is a monopusher design, with the start, stop and reset functions controlled by the single pusher located between the lugs at 12 o'clock. The pusher's location is a nod to the early Minerva 1/100s-of-a-second stopwatches.

The chronograph elapsed seconds and minutes are displayed co-axially at 6 o'clock. The longer, red-tipped hand displays 60 elapsed seconds on the white outer track, and the shorter solid red hand displays elapsed minutes on the red inner track. The 1/100s of a second are indicated by the center-mounted red hand with arrow tip. This hand makes one trip around the dial per second, displaying the 1/100s of a second increments clearly. The 1/1,000s-of-a-second display is located in a large, curved window at 12 o'clock. Inside the window, the letter "N" and the numerals 0 to 9 indicate the status of the display and denominate 1/1,000s of a second. When the chronograph is running, the small, red, triangle-shaped indicator at the bottom of the window remains motionless, pointing to the red "N." At the moment the chronograph is stopped, the red arrow instantly jumps to indicate the elapsed 1/1,000s of a second. Putting all of these chronograph indications together, in the image above, the total elapsed time is 2 minutes and 19.139 seconds.

The chronograph has its own mainspring barrel, the power reserve of which is visible on the dial at 3 o'clock. The winding crown is bi-directional; turning it one way winds the timekeeping mainspring and the other winds the chrono-

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graph spring barrel. The chronograph's autonomy is 45 minutes when fully charged, and the reserve can be increased by winding the crown while the chronograph is running. Montblanc says the chronograph's long power reserve helps maintain the balance wheel's amplitude, which increases timekeeping precision. Another interesting feature: the chronograph escapement has its own regulator, which is visible in the image of the movement through the caseback.

HOW DOES MONTBLANC MEASURE MILLISECONDS WITH SUCH A "SLOW" OSCILLATOR? THAT'S WHERE GOMILA'S CHILDHOOD HOOP COMES IN.

Now that we comprehend the dial, we can discuss what lies behind it. Or at least we can discuss what we know, because Montblanc has not yet fully revealed all of the technical details.

Like TAG's Mikrotimer, Montblanc's Bi-Fréquence employs two separate mainsprings, oscillators and escapements – one for keeping the time of day, and one for the chronograph. The timekeeping balance wheel oscillates at a leisurely 18,000 vph, or 2.5 Hz. The chronograph balance oscillates at 360,000 vph, or 50 Hz. Those of you keeping score at home may be wondering how a chronograph running at 50 Hz can measure 1/1,000 of a second, since 50 Hz is the frequency required to measure 1/100s of a second. How does Montblanc measure milliseconds with such a "slow" oscillator? That's where Gomila's childhood hoop comes in.

Typically, there is a direct relationship between the speed or frequency of a chronograph's escapement and the fractions of seconds it can measure. The famous Zenith El Primero movement beats at 5 Hz, or 36,000 vph, and it can measure 1/10s of a second. That's because the balance wheel makes 10 vibrations, or back-and-forth rotations, per second. Multiply that by the 60 seconds in a minute, then again by the 60 minutes in an hour, and you have the 36,000 vibrations per hour rate. If you multiply the El Primero's rate by 10, that yields 50 Hz, or 360,000 vph, which can measure 1/100 of a second. Ten times faster still is 500 Hz, or 3.6 million vph, which can measure 1/1,000 of a second. That's what TAG's Mikrotimer does.

Montblanc takes a very different route to achieving millisecond resolution for its watch. Its chronograph escapement operates at 50 Hz, so it can measure 1/100s of a second. However, Montblanc adds a special wheel that it calls the "thousandths wheel," or *mobile de millième* in French. This wheel is Gomila's childhood hoop. The "hoop" receives an impulse from the chronograph gear train (the childhood stick) that causes the *mobile de millième* to rotate 10 times per second. Quoting Montblanc, the rotating *mobile de millième* "provides the resolution with which hundredths of a second can be further subdivided into sets of 10 increments."

Montblanc has not yet revealed the exact nature of the interaction between the chronograph gear train, the *mobile de millième*, and the 1/1,000 of a second indicator. That may be because there are two primary and 24 subsidiary patents pending on the system that translates a lower frequency into timekeeping resolution that would normally require a higher frequency. Schmiedt noted that Montblanc's translation principles will work with other frequencies.

We can report that the prototype watch we examined started, stopped and reset perfectly, and the 1/1,000s of a second display appeared to function as described. Of course it is not possible to discern with only a pair of eyes whether 1/1,000s of a second are actually being measured. Montblanc says it has tested the watch with a stroboscope to ensure that it is in fact measuring the milliseconds correctly.

Schmiedt did confirm that the movement is fully integrated, and that it is an original, "clean sheet of paper" design – no existing plates or modules were used in the construction. The chronograph functions are controlled by a two-level column wheel: one level guides the start, stop and zero-return functions; the other level controls the 1/1,000s. The *mobile de millième* does not engage with the gear train in the traditional manner, so it does not increase wear and tear on the movement. Montblanc considers the movement to be a world first – not for measuring 1/1,000s of a second, but for the way in which the 1/1,000s are measured.

Though the chronograph is fast, the reset function is not. It appears to operate in slow motion. This design feature allows the owner to appreciate the complexity of the watch in a subtle and compelling way.

According to Schmiedt, development of the movement took a team working at Villeret two and a half years. Gomila spent 10 months in Villeret last year building the prototype himself. Montblanc's constructors created the parts, and Gomila assembled everything himself.

The movement has 472 parts, including 45 bearing jewels, and measures 38.4 by 10.6 mm. It is housed in a white gold case that measures 47 by 15.1 mm.

Schmiedt says the Bi-Fréquence meets each of the four challenges recognized by Montblanc: it precisely measures 1/1,000s of a second, it does not suffer wear-and-tear-related issues, it is easy to read, and the chronograph's power reserve makes it useable in real life.

A total of 36 pieces will be produced, priced at $305,900. Montblanc's target is to deliver the first piece by the end of the year, and to deliver one or two pieces per month after that. The series is not yet completely sold out, but according to Schmiedt, "a large part" of the production is preordered. Schmiedt expects that it will take about two years to deliver all of the pieces. Apparently measuring milliseconds is not a fast process, after all.

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Amateur Hour

What happens when eight journalists play watchmaker for a day? Lots of trials and errors.

I hate yoke springs. And I am not too crazy about click springs, either, if you want to know the truth.

What's my beef with the springs, you ask? Simple: The tiny tormentors, two of 78 components in an ETA 6497-1 caliber, led to my undoing as an apprentice watchmaker. And not just me. From the moans and groans in the small conference room at the Peninsula Hotel in New York City one afternoon in May, the seven other watchmakers-for-a-day were having similar struggles.

Workshop leader Gianfranco Ritschel

The eight of us – each a journalist who writes about watches – were participants in a watchmaking workshop that is essentially Watchmaking For Dummies (a particularly apt description of our group). It was sponsored by the Fondation de la Haute Horlogerie, a Geneva-based organization devoted to raising public awareness of the art and science of fine watchmaking. The three-hour workshop is one of the FHH's educational outreach programs, designed to give non-watchmakers a hands-on appreciation of the intricacies of watchmaking. Led by trained watchmakers (there were three for the eight of us), participants learn how to take apart the ETA 6497 and put it back together again.

I agreed to attend the workshop with deep misgivings. I've been covering the watch world since The Flood, and have been in enough watch factories to know that my so-called "fine motor skills" aren't really all that fine. I looked forward to spending three hours mauling a watch movement in the presence of a master watchmaker the way I look forward to a root canal: I dreaded it.

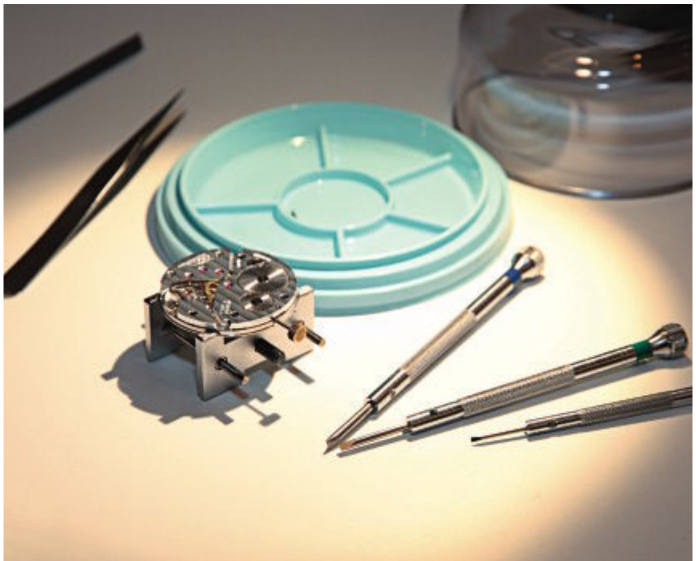
On game day, I get off to a terrible start. In front of each of us is the movement in a holder, a blue dish for the disassembled parts, and our tools: three color-coded screwdrivers, tweezers, a plastic stick called a buff, and a loupe. Step one is pretty simple: Put on the loupe. But I botch it. I wear glasses and I can't quite figure out how to use the loupe with my glasses. As the rest of the gang, properly louped, begin disassembling the movement at the direction of our chief instructor, Gianfranco Ritschel, I am making a spectacle of myself futzing with my spectacles and the loupe. Already behind, I ditch the loupe.

The seminar has two parts. In part one, you take the watch apart. Later, we realize that's the fun part. In part two, you put the movement back together again. Well, you try to, anyway. That's the nightmare part.

Ritschel explains to us that the ETA 6497-1 is a hand-wound pocketwatch movement that was made by Unitas in Tramelan, Switzerland, from 1967 to 1985, when production was taken over by ETA. It's a large movement ("a tractor," Ritschel says) 36 mm by 4.55 mm with a 46-hour power reserve and a frequency of 18,000 vph. Using our tools, bit by bit, we disassemble it. We unscrew lots of screws and out come the cock and balance, the pallet, the ratchet wheel, the crown wheel and the washer in the center, the click and click spring, the barrel bridge, the center wheel, the barrel, other wheels, the setting lever spring and yoke

Rough start: WatchTime ***editor-in-chief Joe Thompson is befuddled by the loupe.***

ETA 6497-1 with the tools used to disassemble it



ROCK SOLID: KOBOLD HIMALAYA

In 2009, Kobold Watch Company founder Michael Kobold and Kobold Ambassador Sir Ranulph Fiennes climbed Mount Everest in support of the Navy SEAL Fund. On their way down, they brought back two rocks from the summit. Three years later, Kobold presents the Himalaya Everest Edition, featuring dials made from the summit rock.

Limited to only 25 watches, the Kobold Himalaya Everest Edition is encased in a U.S.-made stainless steel case. The watch is assembled in the Kobold Watch Company's new workshop in Kathmandu, Nepal by the two Sherpas who accompanied Fiennes and Kobold on their expedition.

Himalaya Everest Edition
Mount Everest summit rock dial
automatic-winding movement
U.S.-made case

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spring, the winding stem, the winding pinion and sliding pinion. All of them end up in the blue dish. Voilà: We have stripped the movement down to what watchmakers call the "platin nu," Ritschel said – the bare plate.

We take a break. When we resume, chaos strikes. Everybody's blue dish is loaded with wheels and screws and other parts. The task is to put our Humpty Dumpty Unitas tractors back together again. But how? What part goes first and where does it go? Good luck. Good grief!

The instructors spring into action. Now there is lots of individual tutoring. "Take this screw. Put it there. No, not there. That's right." Sitting behind me is a British journalist with a wonderful baritone voice. "Ooops, spring's gone," he announces to no one in particular. It's the yoke spring. The instructors manage to find it on the floor. A minute later, he makes another announcement: "It's gone again. It's just disappeared." The instructors bring him a spare. But he loses that one, too.

Meanwhile I am having my own yoke spring problems. It doesn't fly away like my British colleague's. But it doesn't slide into place, either, after endless attempts maneuvering it with the buff and tweezers. Finally, Emmanuel Schneider, one of the instructors, has mercy on me and intervenes. In a flash of his tweezers and buff, the spring slides into place.

Now I move onward. And upward. Literally. While trying to insert the tiny click spring into the movement, it goes the way of my British friend's yoke spring: propelled into oblivion. I see it launch but have no idea where it went. They bring me another.

Ritschel aids the editor of WatchTime.

Suddenly, behind me, the British baritone wails: "Oh, I've done something very, very bad. The screw is now in two pieces. The head has come off!" Short pause. Even more plaintively, "Should I just leave?" A glutton for punishment, he bravely stays.

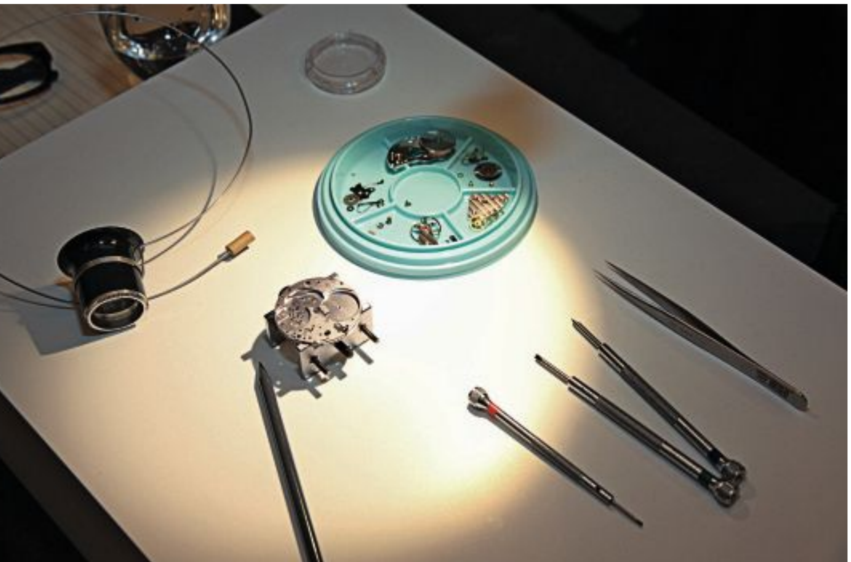
Finally, we get to the last step, inserting the balance wheel. Ritschel explains that there are four maneuvers to make, all at the same time (lift, drag, push, flip, whatever: I couldn't remember them all, let alone attempt them). I realize this is mission impossible. As I stare forlornly at the movement, Schneider appears and whispers to me and the journalist next to me in a lyrical French accent, "There is a trick." He shows us the trick. I take a stab at it. No luck. I try again. Bingo! The balance wheel slips into place and starts gyrating. The watch comes alive, and so do I. I can't believe it. I want to jump up and do an NFL end-zone dance. Wisely, I don't. But it is a "eureka" moment when that movement moves. I am giddy with delight.

The discovery for me was not how hard watchmaking and watch repairing are. I knew that going in. What I learned is how exciting it is when, after all that painstaking effort, the watch works. In some slight way, I got a sense of the satisfaction that drives professional watchmakers to the bench each day.

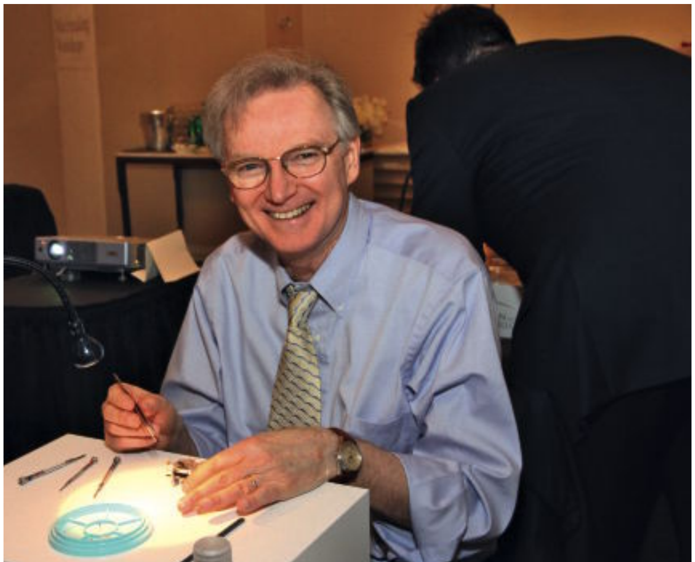
(The FHH offers watchmaking workshops on a regular basis in Geneva. For more information, go to www.hautehorlogerie.org.)

–JOE THOMPSON

Disassembling the movement is easy; reassembling it is hard.



WatchTime***'s editor experiences joy, relief and disbelief when his reassembled movement works.***



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Richemont Romps

The Swiss luxury-goods group Richemont had its best year ever last year. Sales increased 29 percent to a record 8.87 billion euros ($11.80 billion) for fiscal 2012, ended on March 31. Net profit increased 43 percent to a record €1.54 billion ($2.05 billion). The engine of growth was mainland China and Chinese tourists around the world, Richemont said. "The Asia-Pacific region saw the highest level of demand and, following several years of very strong growth, sales in that region now represent 42 percent of group sales," Richemont said in a statement. Europe has fallen to 29 percent of total sales. The Americas (North and South) account for 14 percent.

Watches remain Richemont's most important product, accounting for 50 percent of total sales. Jewelry is second at 25 percent of the total. Watch sales increased 33 percent in fiscal 2012 to €4.4 billion ($5.85 billion). Thirteen of the group's 18 luxury brands sell watches. These include the nine brands in the Specialized Watchmakers division (IWC, Jaeger-LeCoultre, Piaget, Vacheron Constantin, Officine Panerai, Baume & Mercier, A. Lange & Söhne, Roger Dubuis, and Ralph Lauren) and four brands better known for other products (Cartier, Van Cleef & Arpels, Montblanc, and Dunhill). Sales in the Specialized Watchmakers division increased 31 percent for the year to €2.32 billion ($3.09 billion).

The year-end results confirmed the success of Richemont's push in recent years to expand its network of company-owned boutiques and trim its wholesale network. Richemont's retail division, consisting of its brand's boutiques and the online retailer Net-A-Porter, accounted for 53 percent of sales versus 50 percent the previous year. The group had 948 directly operated boutiques at the end of March versus 876 at the end of March 2011. The group also has an additional 608 brand boutiques operated by partners.

So strong were the group's results that in a presentation to analysts it struggled to find enough superlatives to describe each brand's performance. Richemont does not reveal sales data by brand. But its brand-by-brand review of the year showed that all its watch brands participated in the boom, including Baume & Mercier, which reported losses in fiscal year 2011 and 2010:

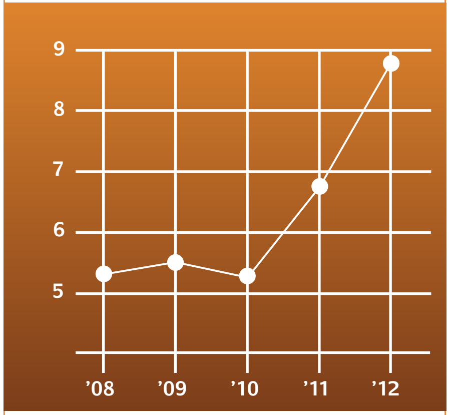
- **Cartier:** "Record sales…remarkable growth across products and channels."
- **Van Cleef & Arpels:** "Record sales…outstanding growth."
- **Piaget:** "Very strong increase in sales…excellent performance across regions and channels."
- **Vacheron Constantin:** "Very robust growth, most notably in Asia and the USA."
- **A. Lange & Söhne:** "Very robust performance across most markets."
- **Roger Dubuis:** "Substantial sales growth driven by Asia and Americas."
- **Jaeger-LeCoultre:** "Commendable broad-based growth."
- **IWC:** "Significant growth across regions."
- **Officine Panerai:** "Strong sales driven in particular by Europe, Asia Pacific and the Middle East."
- **Baume & Mercier:** "Marked growth in sales leads to break-even following fiscal year 2011's transition year."
- **Montblanc:** "Sales growth of 9 percent driven by watches, leather and retail…Watches continue to lead sales growth."

Looking ahead, Johann Rupert, Richemont's CEO, said in a prepared statement, "Our *maisons* remain entrepreneurial and innovative businesses at heart. More than ever, we are convinced of their resilience and long-term prospects. We therefore look forward to the future with cautious optimism." He did note that "we are mindful of the unstable economic environment, particularly in the euro zone."

Additionally, in comments to stock analysts at the presentation of the year-end results, he acknowledged that the group's performance is now very dependent on developments in China. "We are now a 'China play,'" he said. "Personally I don't think anything is going to go wrong in China…. But I've got to give you a counterbalance that if I am wrong on China, we're going to have issues…. It will be too ghastly to contemplate for all of us, because, believe me, it will [affect] every single large company." (For more on Rupert's comments, see the Last Minute column on page 130).

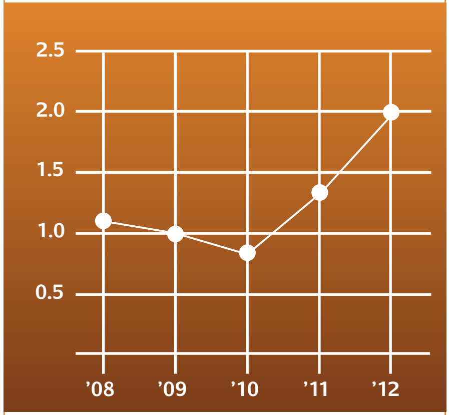
—*JOE THOMPSON*

Sales* (in billion euros)



* For fiscal year ended March 31
Source: Richemont

Operating Profits* (in billion euros)



* For fiscal year ended March 31
Source: Richemont

NAUTISCHE INSTRUMENTE
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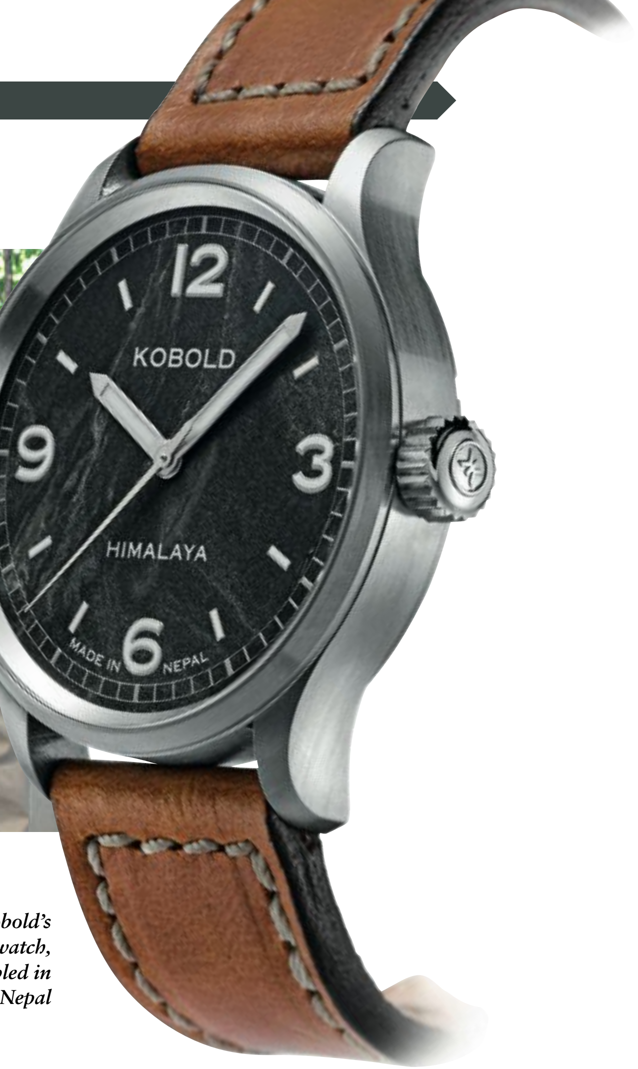
Marinus Chronograph Edition Fulda Challenge

The Marinus Chronograph is distinctive and unscathed as it emerges from the water. But the watch is no longer satisfied with tackling just one element. Whether surfing, snowboarding, sailing or snowshoeing: this outdoor timepiece from Mühle-Glashütte also stands up to the challenges of snow and ice. The Marinus Chronograph has qualified for the Fulda Challenge 2012 thanks to its striking character and is now being launched as a special limited edition.

Join Mr. Thilo Mühle, CEO of Mühle Glashütte, at one of our exclusive Road Show Tour locations:

8/31 - 9/1 Laporte Jewelers - PA | **9/7-9/8** Little Treasury Jewelers - MD | **10/18 - 10/20** Fox's Gem Shop - WA
10/26 - 10/27 E.D. Marshall Jewelers - AZ | **11/2 - 11/3** Old Northeast Jewelers - FL

Namgel Sherpa, left, and Thundu Sherpa as mountain guides and as watchmakers



Kobold's Himalaya watch, assembled in Nepal

Made in Nepal

Michael Kobold, who founded Kobold Watch Co. in Pittsburgh 14 years ago, has now opened a branch in, of all places, Kathmandu, Nepal.

It all began in 2008 when Kobold, an avid mountaineer, and Kobold Watch-endorser and celebrated explorer Sir Ranulph Fiennes met two Sherpas, working as porters and mountain guides, during an unsuccessful bid by Fiennes to reach the top of Mount Everest. Fiennes and Kobold met the two Sherpas, Ang Namgel Sherpa and Lakpa Thundu Sherpa, again in 2009 and 2010, on two successful bids to reach the summit. (Many members of the Sherpa ethnic group have the last name "Sherpa.")

Fiennes, dismayed at the danger the two guides faced in their jobs, suggested that Kobold teach them, and other Sherpas, a safer, and more lucrative, way to make a living: watchmaking.

Kobold did. A watchmaker himself, Kobold launched a training program at Kobold's facility in Pittsburgh, in which two or three Sherpas at a time – Namgel

Fiennes giving the keynote speech at the opening ceremony for Kobold's facility in Kathmandu

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and Thundu Sherpa were the first – would come to Pittsburgh and spend a year studying watchmaking and luxury-watch retailing. They would then return to Nepal, assemble watches there, and sell them to mountaineers as mementos of their Everest expeditions. Should the Sherpas decide to work abroad after their watchmaking training, they would have a marketable skill, Kobold points out. (Many native Nepalese work in other countries because poverty-stricken Nepal has so few jobs.)

Namgel and Thundu Sherpa have now finished their training and are back in Nepal, assembling and selling watches at Kobold's new Kathmandu facility, located in a high-end shopping area frequented by international tourists and mountaineers. More than 200 people attended the inaugural ceremony for the store/workshop. Fiennes was the keynote speaker. The factory's first fruit is a watch with a dial made from a rock that Kobold and Fiennes picked up from the Everest summit in 2009.

Fiennes and Kobold in the Himalayas

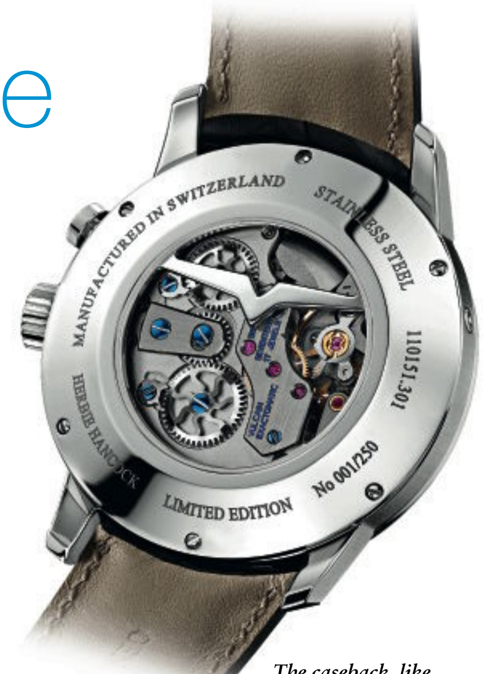
Taking Note

Jazz keyboardist Herbie Hancock, who became famous playing with the Miles Davis Quintet in the 1960s and went on to even greater fame in subsequent decades, has lent his name to a new limited-edition watch from Vulcain.

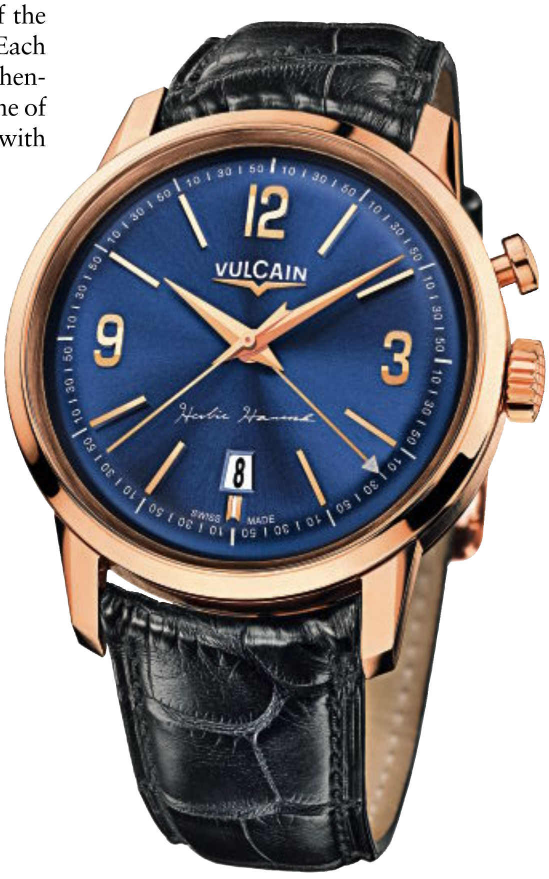
The watch is a 50s Presidents model. It contains the hand-wound Cricket V-16, a double-barrel movement, with a frequency of 18,000 vph and featuring the brand's famously loud, long (20-second) alarm. Hancock's signature appears on the dial and his name in block letters is inscribed on the circumference of the caseback. The watch is 42 mm in diameter.

There are two versions of the watch, one with a rose-gold case ($21,450) and one with a steel case ($7,550). Both have blue, sunray-finish dials and sapphire casebacks. There will be 50 pieces of the gold model and 250 of the steel. Each watch comes with a certificate of authenticity bearing Hancock's signature. One of Hancock's albums is also included with the watch.

Herbie Hancock



The caseback, like the dial, bears Hancock's name



The Herbie Hancock limited-edition model in rose gold

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News About *WatchTime*

WatchTime has introduced a new subscription package called “All Access,” which gives readers full access to *WatchTime* in every media channel. All Access includes the following:

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Photo: Tatijana Shoan

Merk

Bennahmias

Merk Out, Bennahmias In

Philippe Merk has resigned from his post as CEO of Audemars Piguet. He has been succeeded, on an interim basis, by François-Henry Bennahmias, who was the brand’s CEO in North America. A statement signed by AP Chairwoman Jasmine Audemars and Merk said that Merk departed “due to differences in company strategy.”

Merk became CEO in December 2008. Prior to that he was the CEO for the Swiss brand Maurice Lacroix.

Bennahmias, 48, joined Audemars Piguet in 1996 and in 1999 became the chief of its North American operations.

Comco Extends Swatch Group Cutbacks

The Swiss Competition Commission (Comco) has extended by one year the cutbacks it is permitting the Swatch Group to make in deliveries of movements made by its ETA subsidiary and escapement assortments made by its Nivarox unit. Comco is investigating, at the Swatch Group’s request, whether ETA and Nivarox should be allowed to decrease or completely stop deliveries to other watch companies permanently. Pending the outcome of the investigation, Comco is permitting the Swatch Group to decrease by 15 percent and 5 percent, respectively, its deliveries of complete movements and Nivarox assortments. Comco initially expected to finish the investigation and make a ruling by the end of this year, but has now announced it will not rule until next year and will therefore allow the cutbacks to continue through all of 2013.

Correction

The prices for the Corum Admiral’s Cup Legend 42 Annual Calendar given on page 82 of the June 2012 issue were incorrect. The correct price for the rose-gold version (shown here) is $25,900. The steel version is $9,200.

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Global Watch Exports Edition

402.7

Number of watches in millions exported by Hong Kong

682.1

Number of watches in millions exported by China

14.5

Number of watches in millions exported by Germany

Made in China

8.8

Value of Hong Kong watch exports in billion U.S. dollars

29.8

Number of watches in millions exported by Switzerland

Made in the USA

7.4

Number of watches in millions exported by the United States

Made in Germany

21.8

Value of Swiss watch exports in billion U.S. dollars

3.7

Value of Chinese watch exports in billion U.S. dollars

2.0

Value of German watch exports in billion U.S. dollars

2

Average export price in U.S. dollars of a Chinese watch

15

Average export price in U.S. dollars of a Hong Kong watch

688

Average export price in U.S. dollars of a Swiss watch

Source: Federation of the Swiss Watch Industry

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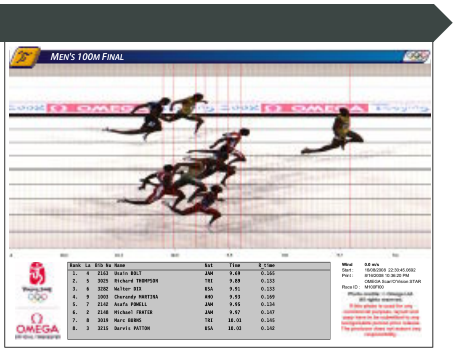

Rank	La	Bib Nu	Name	Nat	Time	R_time
1.	4	2163	Usain BOLT	JAM	9.69	0.165
2.	5	3025	Richard THOMPSON	TRI	9.89	0.133
3.	6	3282	Walter DIX	USA	9.91	0.133
4.	9	1003	Churandy MARTINA	AHO	9.93	0.169
5.	7	2142	Asafa POWELL	JAM	9.95	0.134
6.	2	2148	Michael FRATER	JAM	9.97	0.147
7.	8	3019	Marc BURNS	TRI	10.01	0.145
8.	3	3215	Darvis PATTON	USA	10.03	0.142

Wind: 0.0 m/s
Start: 16/08/2008 22:30:45.0692
Print: 8/16/2008 10:36:20 PM
OMEGA Scan'O'Vision STAR
Race ID: M100FI00

Omega's photo-finish camera shoots how many frames per second?

1. Which of these was an actual name for an Olympic innovation?
A. Omegascope
B. Seik-O-Vision
C. Glock-O-Clock
D. TAG-O-Matic

2. At the inaugural modern Olympics in Athens in 1896, why did American James Connolly arrive in Greece only 24 hours before his event?
A. His ship got lost when the navigator became confused.
B. His ship had to change course to avoid a storm.
C. The Greek calendar differed from Connolly's American calendar by several days.
D. His ship encountered pirates and the passengers were robbed of their possessions.

3. Omega's "photo-finish" camera used in the Olympics shoots how many frames per second?
A. 500
B. 1,000
C. 2,000
D. 10,000

4. The chronographs Omega supplied to the 1932 Olympics were certified as chronometers by the Observatory at Neuchâtel and which other organization?
A. Royal Observatory, Greenwich
B. U.S. Naval Observatory
C. Geneva Observatory
D. U.S. National Physics Laboratory

5. Which Olympics were the first to use electronic timers?
A. 1936 Berlin
B. 1948 London
C. 1952 Oslo
D. 1952 Helsinki

6. In Olympic track and field sprint races, how are false starts detected?
A. Spotters watch each runner from behind.
B. Pressure sensors in the starting blocks
C. Motion sensors mounted behind the runners
D. Pressure sensors in the track where the hands are placed

7. Olympic track and field sprinters receive a false start if they react to the starting gun faster than:
A. 1/5 of a second
B. 1/8 of a second
C. 1/10 of a second
D. 1/20 of a second

8. Which Olympics marked the first time a single company was selected to time all events?
A. 1928 Amsterdam
B. 1932 Los Angeles
C. 1948 London
D. 1952 Helsinki

9. The official name for the semi-automatic timing system for swimming introduced at the Melbourne games in 1956 was:
A. Swim Eight-O-Matic
B. Swim Touch-O-Matic
C. Swim Stroke-O-Rama
D. Swim Time-O-Tron

10. Which of these watch brands was an official Olympic timer?
A. Heuer
B. Rolex
C. Citizen
D. Casio

11. Which Olympics saw the first use of contact or touch pads to aid timing in swimming?
A. 1964 Tokyo
B. 1968 Mexico City
C. 1972 Munich
D. 1976 Montreal

12. What was unusual about the 1980 men's 100 meters final?
A. The gold and silver medalists both had the same time.
B. The winner was unaccustomed to using starting blocks as required by Olympic rules.
C. The time difference between the first and last place finishers was only 0.24 seconds.
D. All of the above

13. Which of these is a timing innovation introduced by Omega at the 2010 Olympics?
A. An electronic starting gun that emits light
B. A stopwatch that automatically accounts for the user's delayed reaction times
C. Police-style laser guns to determine speed-skaters' speed
D. Tiny computer chips in skiers' helmets measured their speed

14. Which of these Olympic finishes was NOT decided by 0.01 of a second?
A. Gail Devers edges out Juliet Cuthbert in the 1992 women's 100 meters
B. Michael Phelps edges out Milorad Cavic in the 2008 men's 100-meter butterfly
C. Hasely Crawford edges out Don Quarrie in the 1976 men's 100 meters
D. Carl Lewis edges out Linford Christie in the 1984 men's 100 meters

15. Who had the first sub-10-second gold-medal-winning 100-meters performance?
A. Bob Hayes in Tokyo in 1964
B. Carl Lewis in Los Angeles in 1984
C. Valeriy Borzov in Munich in 1972
D. James Hines in Mexico City in 1968

Answers: 1A; 2C; 3C; 4D; 5D; 6B; 7C; 8B; 9A; 10A; 11B; 12D; 13A; 14D; 15D

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MAKING IT NEW

The Luminor 1950 3 Days 47 mm is a near-replica of a coveted vintage Panerai. Inside, though, is a new in-house movement. How do case and caliber fare under our close scrutiny?

BY JENS KOCH

PHOTOS BY MARCUS KRÜGER, HAMBURG

Pros

- + Attractive design
- + Very good legibility
- + *Manufacture* movement with long power reserve

Cons

- − Plexiglas soon becomes scratched
- − Mediocre rate results

LUMINOR
PANERAI
REG.
L SWISS L

The Panerai Luminor 1950 3 Days 47 mm, Reference PAM 372, is a tribute to a much-sought-after vintage Panerai watch, Reference 6152/1. Like that model, the PAM 372, introduced last year, is a two-handed watch with a hand-wound movement. Unlike the original, which had a movement made by Rolex (caliber 618), the PAM 372 contains Panerai's new in-house movement, caliber P.3000.

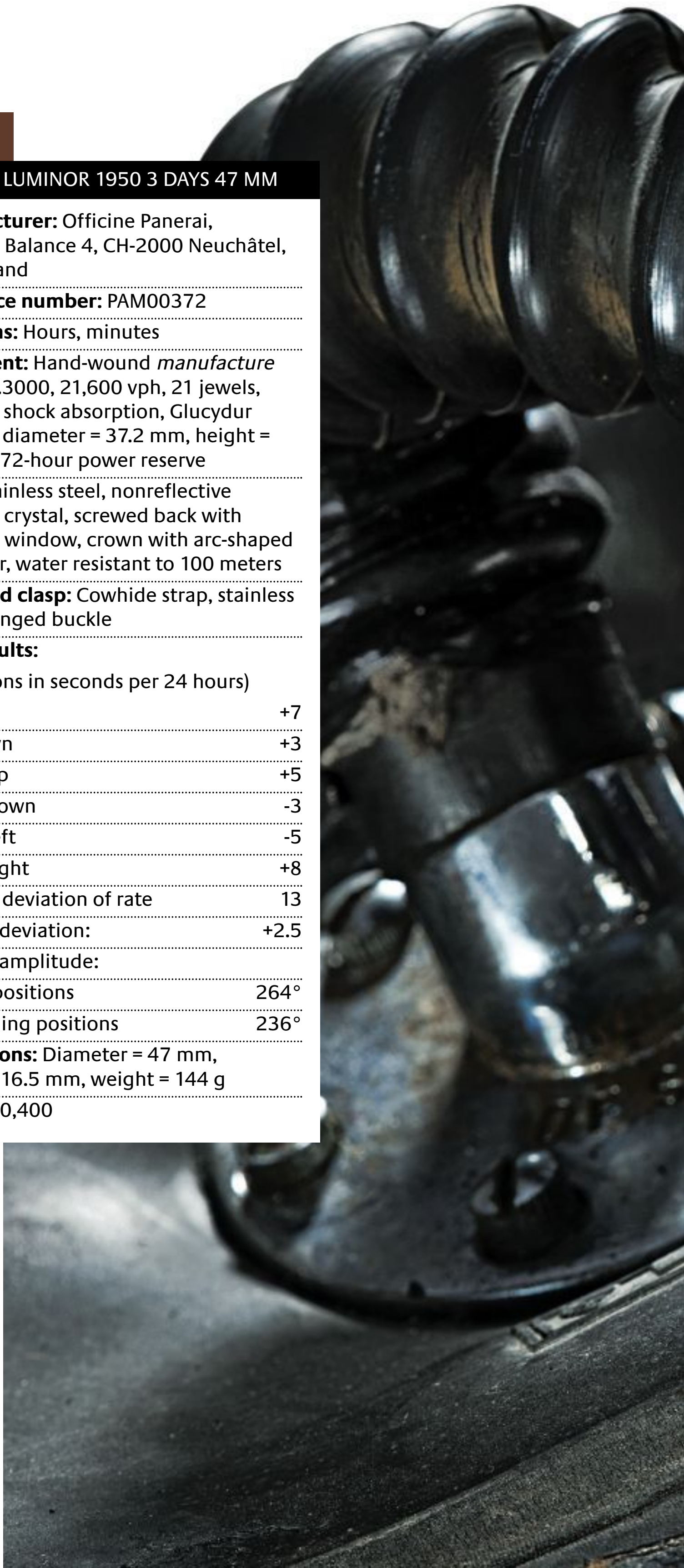
Panerai has designed a "new" case for the PAM 372. With thicker lugs and a more emphatically cushion-shaped middle piece, it looks very much like the case of the original model. Like it, the PAM 372 case is entirely polished but for the crown protector, which is satin finished. The case is milled and very well crafted.

As with the original, the words "Luminor Panerai" have been engraved on the dial rather than merely printed. And, as with the original (and other early Panerai watches), the case number is inscribed between the lower lugs and the reference number between the upper lugs, and the watch crystal is made of Plexiglas. The hands, however, have been modified: those on the earlier watch were solid brass, but those on the new model are gold-plated. The luminous material used for the dial, which has the brand's famous "sandwich" construction, is light brown, which enhances the dial's vintage appearance.

Caliber P.3000 is a large 16 lignes in diameter, the same size as the Rolex 618. It is Panerai's 10th in-house movement since the brand began making its own movements in 2005. It is 5.3 mm thick and has a screwed balance, 13.2 mm in diameter, with a frequency of 21,600 vph. The balance sits beneath a sturdy balance bridge. The movement has 160 components, including 21 jewels.

The watch's other bridges, which are quite large, conceal much of the movement, but they are very practical because they ensure the movement's stability. One of them sits above the gear

The PAM 372 (left) and its predecessor, Reference 6152/1 (ca. 1955)



SPECS

PANERAI LUMINOR 1950 3 DAYS 47 MM

Manufacturer: Officine Panerai,
rue de la Balance 4, CH-2000 Neuchâtel,
Switzerland

Reference number: PAM00372

Functions: Hours, minutes

Movement: Hand-wound *manufacture* caliber P.3000, 21,600 vph, 21 jewels, Incabloc shock absorption, Glucydur balance, diameter = 37.2 mm, height = 5.3 mm, 72-hour power reserve

Case: Stainless steel, nonreflective Plexiglas crystal, screwed back with sapphire window, crown with arc-shaped protector, water resistant to 100 meters

Strap and clasp: Cowhide strap, stainless steel pronged buckle

Rate results:

(Deviations in seconds per 24 hours)

Dial up	+7
Dial down	+3
Crown up	+5
Crown down	-3
Crown left	-5
Crown right	+8
Greatest deviation of rate	13
Average deviation:	+2.5
Average amplitude:	
Flat positions	264°
Hanging positions	236°

Dimensions: Diameter = 47 mm, height = 16.5 mm, weight = 144 g

Price: $10,400

12
LUMINOR
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REG
T.M.
12
LUMINOR
PANERAI
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6

The special shape of the prong ensures that the strap won't be bent too severely and suffer damage.

SCORES

PANERAI LUMINOR 1950 3 DAYS 47 MM

Strap and clasp (max. 10 points): The pronged buckle and the strap are well crafted, and the prong is cleverly shaped to prevent the thick strap from being bent too severely. **8**

Operation (5): The crown protector doesn't interfere with the crown's operation. The hour hand can be conveniently reset in hourly increments. **5**

Case (10): The designers emulated the historical model with tremendous fidelity to detail. The craftsmanship is excellent, but the Plexiglas crystal is susceptible to scratches. **8**

Design (15): A beautifully simple watch has been re-created. **15**

Legibility (5): Nothing interferes with the legibility of the large, brightly luminescent hands and markers. **4**

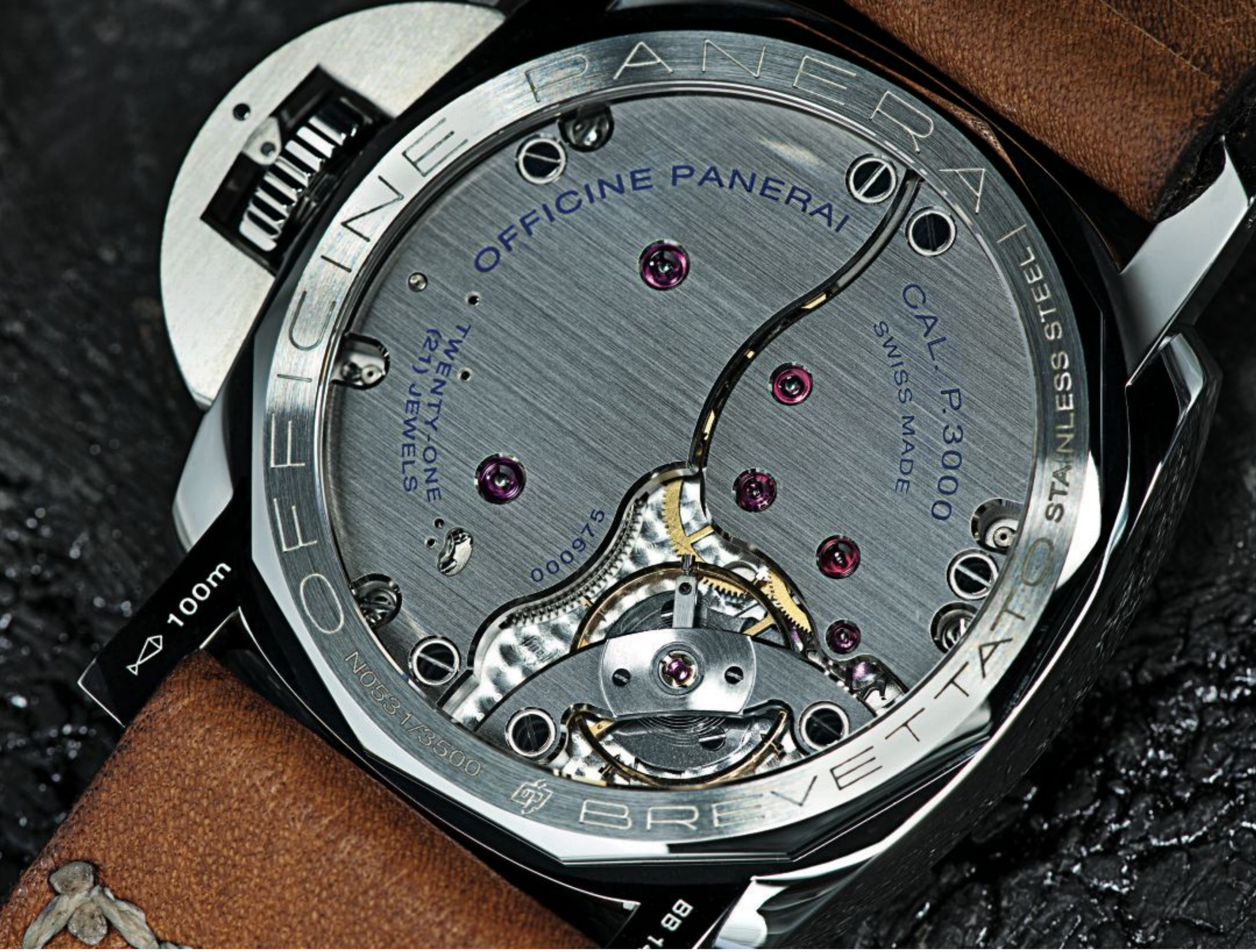
Wearing comfort (10): Despite its size, this watch is very comfortable on the wrist. **9**

Movement (20): Well-engineered caliber P.3000 is robust, has a long power reserve and can be finely adjusted without a regulator. The unostentatious decorations are a good match for this watch's simple design. **16**

Rate results (10): Large deviations among the various positions prevent us from giving a higher score, but the average deviation is good and the amplitude is adequate. **6**

Overall value (15): The watch's craftsmanship, its in-house movement and its demonstrated ability to hold or increase its value over time (partly due to the watch's limited availability) justify its rather high price. **12**

TOTAL: 83 POINTS



Equipped with a balance bridge and two other large bridges, caliber P.3000 is designed to be sturdy.

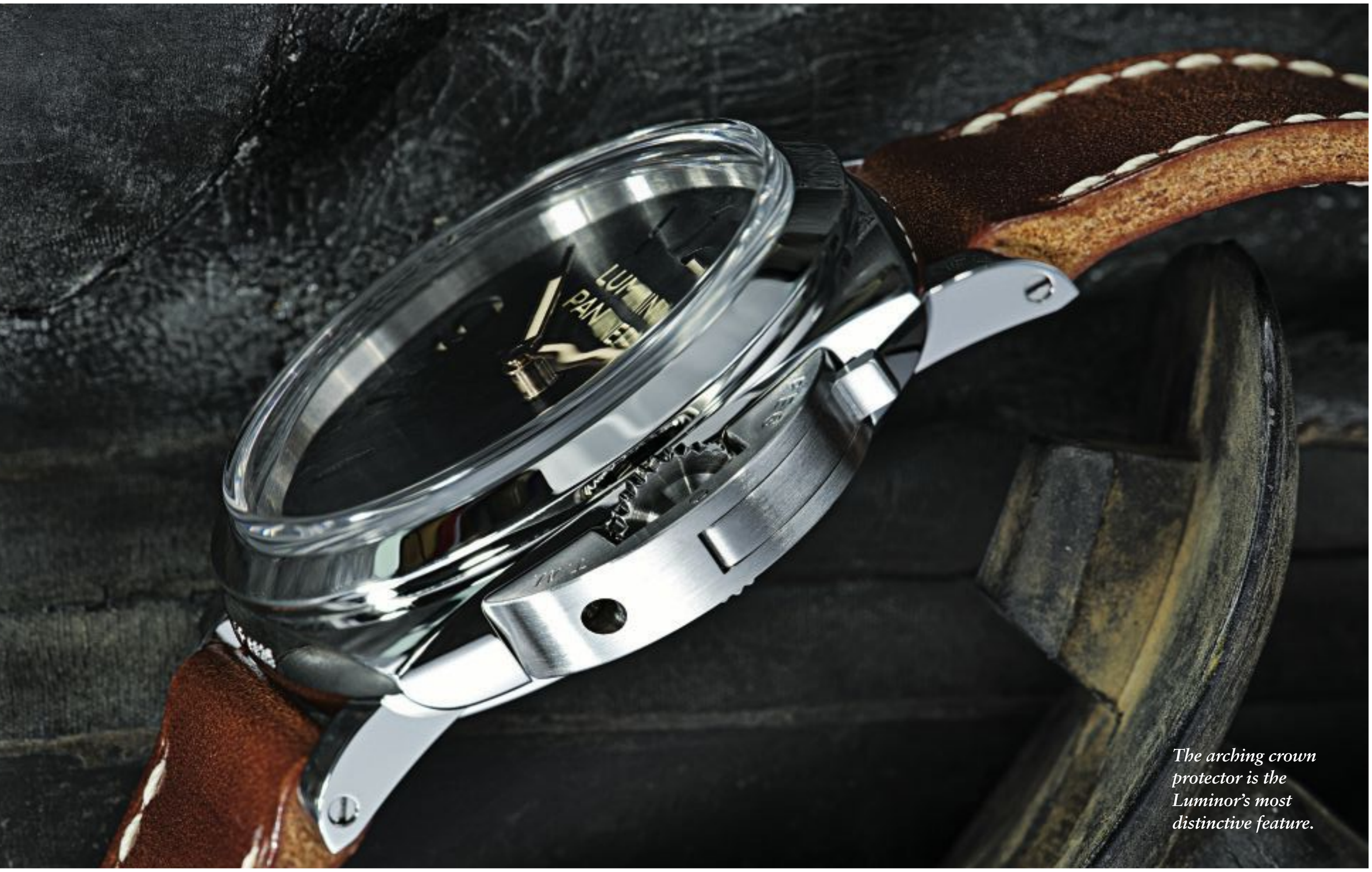
train and the other above the two barrels. A hole drilled in the latter enables a watchmaker to slacken the mainsprings via the ratchet.

The bridges have arabesque-like contours, in keeping with the watch's overall vintage flavor, and the movement's decoration also has an old-time look. The most noticeable embellishment is a tastefully unostentatious finish applied in precisely the same direction on all three bridges. The rims of the sinks for the screws and the jewels are beveled, as are the edges of the bridges. It takes a strong loupe and good eyesight to see that the beveled edges aren't polished, but only very precisely milled.

Our timing machine revealed a mixed picture of the movement's performance: irregularities in the rate became apparent only after some time had passed. The average deviation across all positions was a satisfactory +2.5 seconds per day, but there were large differences among the individual positions. The extremes were +8 and –5 seconds per day, which resulted in 13 seconds for the greatest deviation of rate among the various positions. The amplitude in the hanging position was an acceptable 236 degrees.

The movement has a useful feature: when you pull the crown out to its first position, you can reset the hour hand without affecting the minutes hand. This way you can adjust the watch quickly for Daylight Savings Time or when you travel and change time zones. By pulling the crown out to its second position, you can set the minutes hand, and, as it rotates, the hour hand.

The long, 3-day power reserve also deserves praise. The Rolex caliber in the 6152/1 had a power reserve of just 36 hours. Nostalgically minded purists might protest that the new watch should have the same power reserve as the old one did, but we're more practically minded so we applaud this improvement. (Panerai ultimately replaced the Rolex calibers in its 6152/1 with Angelus movements that had 8-day power reserves.



The arching crown protector is the Luminor's most distinctive feature.

These watches are easy to recognize by the seconds subdials at 9 o'clock.)

We feel the same way about the transparent back. Though it's true and also quite surprising that Panerai first introduced transparent backs as early as 1956, they were only used on watches with Angelus calibers. The back of the PAM 372 is made of sapphire crystal, but the old Angelus-fitted models had Plexiglas backs. The engraving on the ring in the caseback has remained unchanged: "Officine Panerai Brevettato." ("Brevettato" is Italian for "patented.")

The watch is quite comfortable to wear despite its size, thanks mostly to the low positioning of the lugs. The screwed crosspieces that attach the strap to the case have thick outer bushings for greater security.

The watch's vintage appearance is underscored by a very thick, reddish-brown strap, which has pale contrasting stitching and no lacquer along its sides. The strap is quite stiff, but nonetheless comfortable on the wrist. The watch comes with an additional leather strap that is lighter in color and more supple. A screwdriver is also included. It's easy to change the strap because the crosspiece is screwed between each pair of lugs. The crosspiece of the buckle is also screwed and can be easily removed. The watchmaker who helped us with this test suggested that a bit of screw adhesive on the threading would have been a welcome addition, especially because this special glue continues to serve its purpose even after the threaded fasteners have been screwed and unscrewed numerous times.

The strap buckle is different than the one on the original watch: it's curved rather than straight. Many people who wore the 6152/1 bent the buckles so they would be less likely to snag. The clasp and the prong, which is quite broad, are milled and very well made. The prong is shaped so that it barely bends the strap when inserted in a hole. The clasp is satin finished, as on the original.

The PAM 372 sells for $10,400. That's a tall stack of coins for a watch with a hand-wound movement, no date display, no seconds hand and no sapphire crystal. But the price is justified by the high quality of all the watch's components and the well-engineered Panerai caliber. Furthermore, this model is anything but a shelf-warmer: Panerai is making 3,500 of these watches (not 3,000, as was initially announced), but even that seems like a drop in the bucket compared to demand. It's not at all easy to get your hands on this model. As a result, second-hand PAM 372s sell for more than new ones. ○

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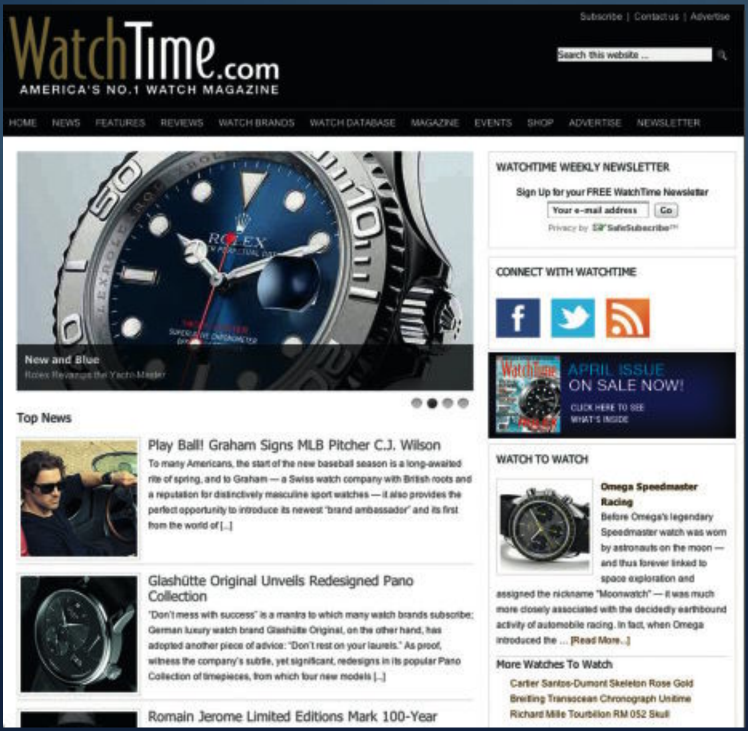

New and Blue
Rolex Revamps the Yacht-Master

Top News

Play Ball! Graham Signs MLB Pitcher C.J. Wilson

To many Americans, the start of the new baseball season is a long-awaited rite of spring, and to Graham — a Swiss watch company with British roots and a reputation for distinctively masculine sport watches — it also provides the perfect opportunity to introduce its newest "brand ambassador" and its first from the world of [...]

Glashütte Original Unveils Redesigned Pano Collection

"Don't mess with success" is a mantra to which many watch brands subscribe: German luxury watch brand Glashütte Original, on the other hand, has adopted another piece of advice: "Don't rest on your laurels." As proof, witness the company's subtle, yet significant, redesigns in its popular Pano Collection of timepieces, from which four new models [...]

Romain Jerome Limited Editions Mark 100-Year

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Omega Speedmaster Racing

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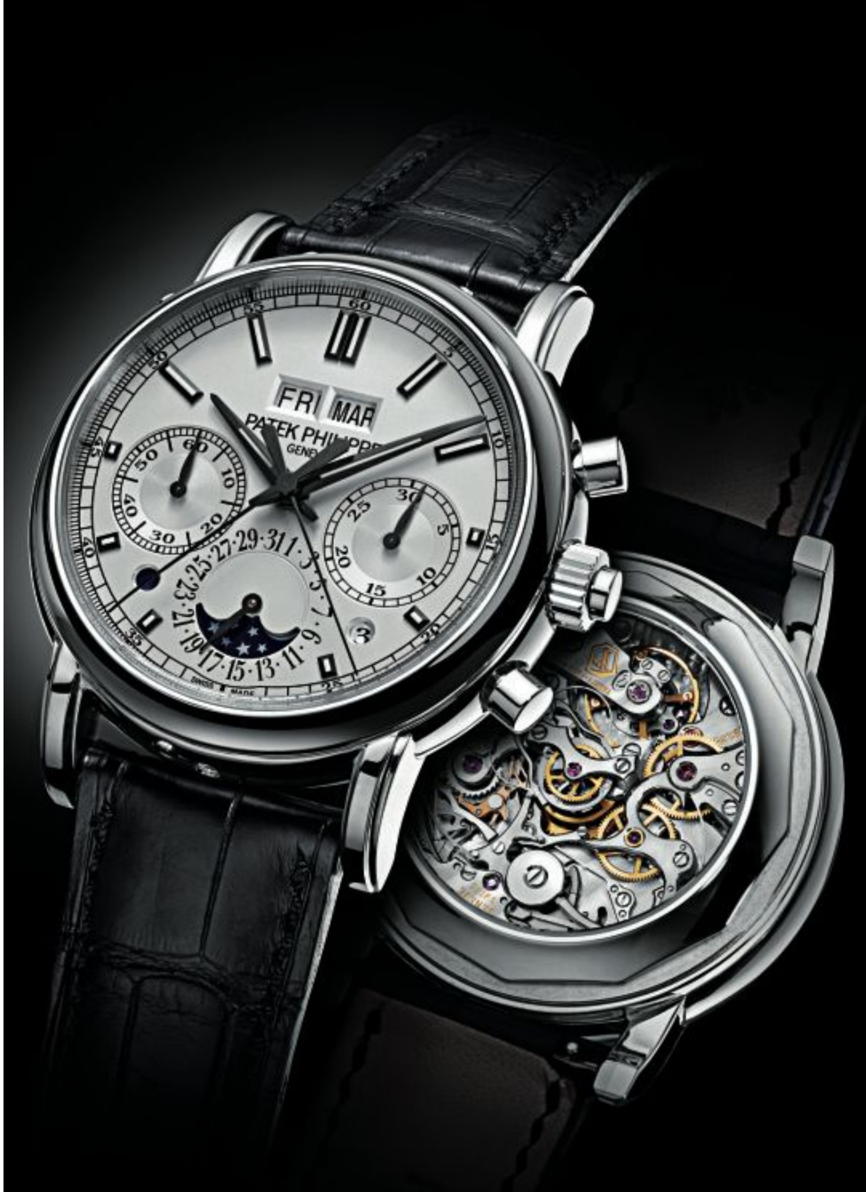
AND BA MAKES THREE

With the launch of Reference 5204 this year, Patek Philippe completes its trilogy of in-house chronograph movements.

BY GISBERT L. BRUNNER

BY

Patek Philippe Reference 5204



The split-seconds chronograph is combined with a perpetual calendar. The leap-year display is between 4 and 5 o'clock.

In 2009, Patek Philippe surprised the watch world when it launched a new in-house manual-wind chronograph movement in a ladies' watch, the appropriately named Ladies First Chronograph (Reference 7071 R). The new movement, Caliber CH 29-535 PS, had a column wheel and a horizontal clutch and marked a turning point for Patek. It was designed to replace Caliber CH 27-70, which for two decades had served as the base for all Patek Philippe chronographs. That movement, however, used a base supplied by Nouvelle Lemania, Caliber 2310. Patek's legion of male collectors, of course, could not wait to get their hands on the new movement, but for that they needed a men's version. Patek assured them the wait would not be long. It wasn't: Patek Philippe unveiled the men's model, Reference 5170, in 2010.

Patek Philippe traditionally produces three types of chronographs: simple chronographs, simple chronographs with perpetual calendars, and split-seconds chronographs with perpetual calendars. So the arrival last year of Reference 5720, a simple chronograph with a perpetual calendar powered by Caliber CH 29-535 PS Q (for quantième perpetual, or perpetual calendar) delighted, but did not surprise, Patek Philippe aficionados. Demand for the watch was strong and the waiting list long.

This year Patek Philippe completed the trilogy. Its new Reference 5204 split-seconds chronograph contains Caliber CHR 29-535 PS Q, the third execution of the caliber introduced in 2009, this time augmented with a split-seconds function. The "R" in the designation stands for rattrapante. The watch's arrival offers the opportunity to take a close look at what Patek has achieved with the movement it developed to end its dependence on the Nouvelle Lemania base.

LET'S START WITH THE chronograph in Reference 5170, the men's model from 2010. The movement is designated Caliber CH 29-535 PS: the "CH" stands for chronograph; the numbers refer to the movement's diameter (29 mm) and height (5.35 mm); the "PS" stands for *petite seconde*, indicating that the seconds are shown on a subdial. The movement contains 272 components in a synthesis of tradition and innovation.

You see the tradition in the movement's architecture, in the classic column-wheel mechanism that controls the chronograph's functions, and in horizontal gear coupling.

Many other details – even if they might not seem so at first glance – are genuinely innovative. For example, the teeth on the coupling wheels have a novel gliding profile that reduces the amount of power these wheels consume and minimizes the little jump that occurs when the chronograph seconds hand starts moving (afterwards the hand runs smoothly and with almost no wobbling). In addition, the depth of engagement of the teeth on the coupling's idle-gear can be finely regulated via an eccentrically shaped cover on the column wheel. And there is improved synchronization between the clutch lever and blocking lever by means of a special finger on the clutch lever.

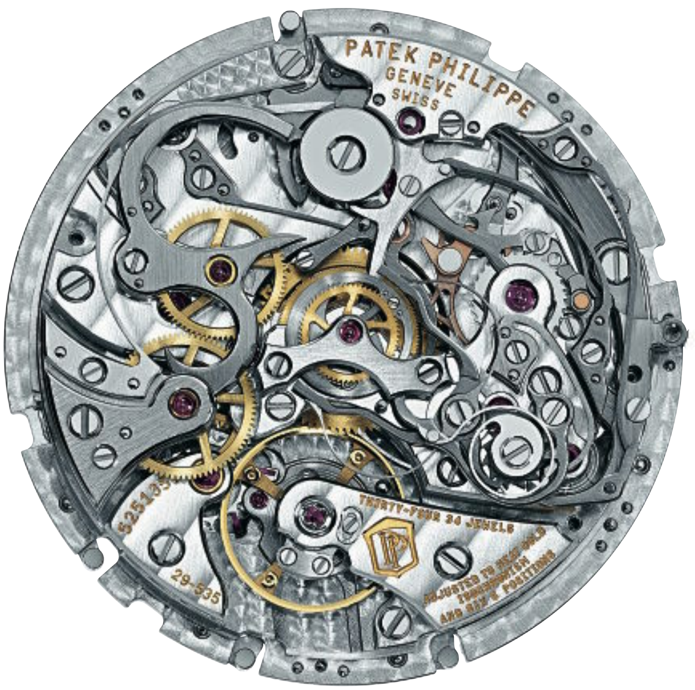
Patek Philippe technicians worked intensively on the movement's return-to-zero mechanism. The speedy return and long length of the elapsed-seconds hand subject this slender indicator to dynamic stresses, which are partly counteracted by a cleverly designed cam for the jumping advance of the elapsed-minute counter. This cam's step has an indentation with a depth corresponding to 60 degrees of the hand's arc. When the elapsed-seconds hand returns to zero, the complexly shaped tip of the minutes-counter lever dips into this indentation so that the hand can neither become deformed nor slip on its staff. After a little leftward swing, the hand returns to the 12 o'clock position without the slightest wagging. Also new: the balance oscillates at 4 hertz (28,800 vph) instead of the previous rate of 2.5 hertz (18,000 vph).

Patek Philippe is acknowledged as a pioneer in the development of perpetual calendars for wristwatches. Its expertise is evident in Reference 5270, the chronograph with perpetual calendar introduced in 2011. Caliber CH 29-535 PS Q uses the CH 29-535 PS as a base, with the addition of a perpetual calendar. This, too, is a new construction. The calendar unit wasn't simply installed on top as a module; it required modifications in the chronograph. Patek Philippe's technicians repositioned both the subdial for the seconds and the elapsed-minutes counter slightly downward toward the 6 to make room for larger disks indicating the day and the month. They also equipped this 1.65-mm-thick mechanism with a rotating cam that "tells" the calendar's mechanism how long each month should be in each ordinary year and each leap year until the year 2100. The moon-phase indicator underneath the little date display does its job with admirable precision, too: its error will amount to one full day's deviation only after 122 years and 45 days. Should this display require adjustment before then, the user need only press the little button on the side of the watch's case.

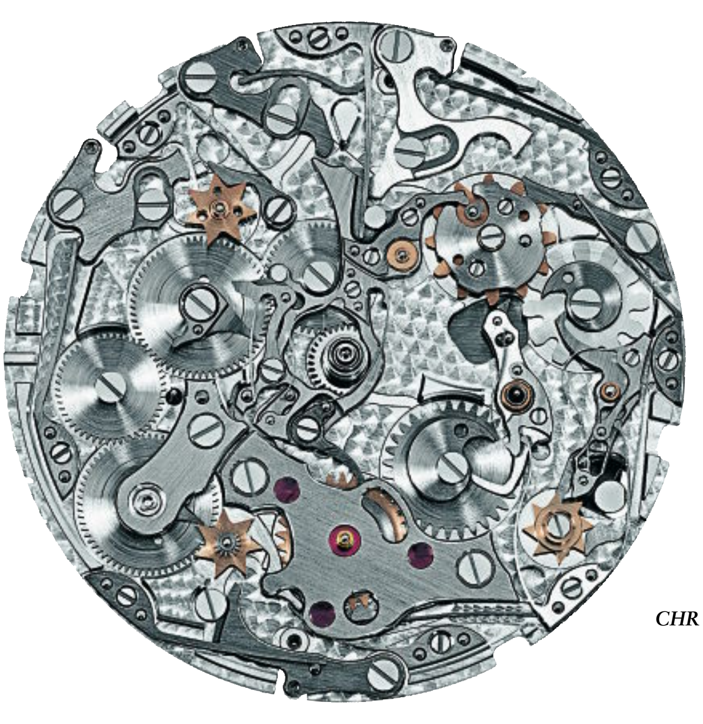
WITH REFERENCE 5204, Patek Philippe went a step further and added a split-seconds function to its CH 29-535 PS Q movement, thus rounding out its collection of in-house chronograph calibers.

Two unconventional details in its construction distinguish this newcomer from the older rattrapante caliber CH 27-70/150 that Patek Philippe used in Reference 5004. The first difference has to do with the isolator. Patek Philippe's design engineers analyzed the older isolator, which connoisseurs called the "octopus," and found a way to improve it. The new version relies on a bidirectional spring installed as a kind of covering plate above the split-seconds column wheel. The construction is ingeniously simple: the push-button mechanism (the button is on top of the crown) and the isolator-spring's end (the latter is cut with so-called "wolf's teeth") move the likewise wolf-toothed isolator wheel just far enough so that a prong, affixed to the wheel, can lift both the split-seconds lever and its roller for the interval during which the split-seconds heart is stopped.

The second innovation, which can only be seen through a watchmaker's loupe, is to be found next to the ruby roller on the patent-protected split-seconds lever. The roller itself has remained unchanged. Due to the system used in previous constructions, slight pendular motions were almost impossible to prevent when the roller rests in the notch of the split-seconds heart. But the new caliber solves this problem with two little supportive surfaces, one positioned to the left and the other to

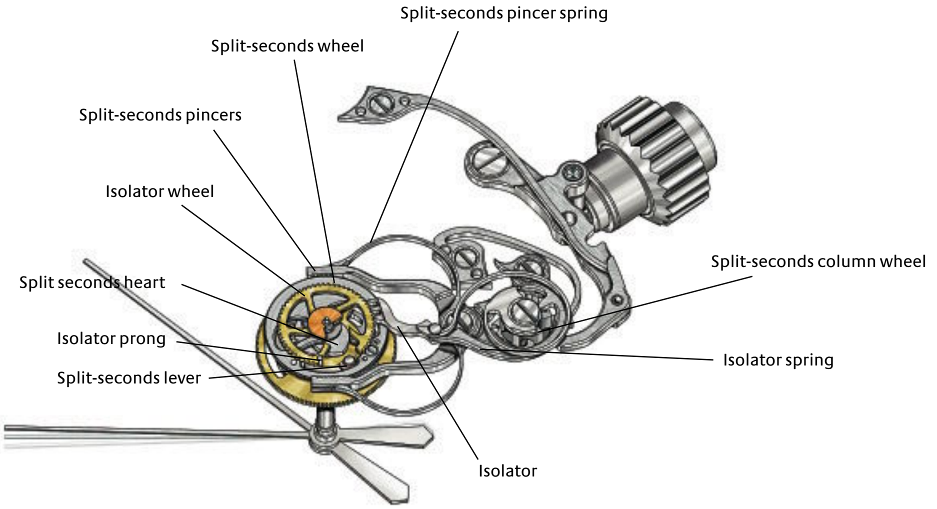


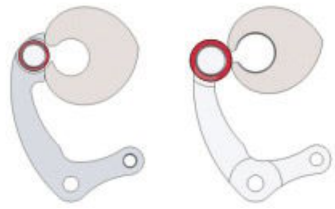
Caliber CHR 29-535 PS Q: the chronograph mechanism with split-seconds capability is visible from the back.



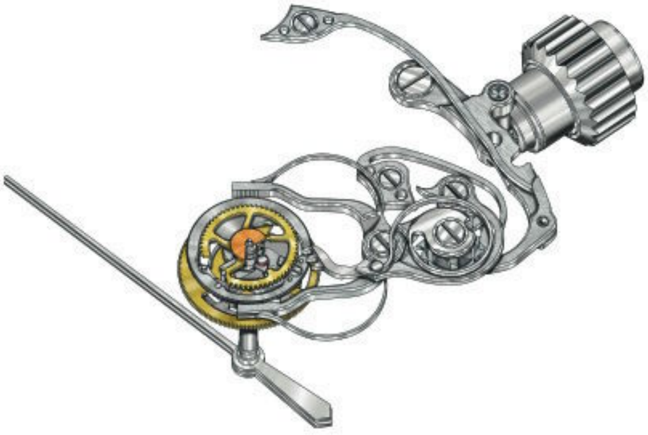
The dial side of Caliber CHR 29-535 PS Q

The split-second pincers are closed, thus stopping the split-seconds hand. The three teeth on the front end of the isolator lever have turned the isolator wheel so that the isolator prong (which is attached to the isolator wheel) can lift both the split-seconds lever and its roller. The connection to the split-seconds heart is severed.





The ruby roller of the split-seconds lever in caliber CHR 29-535 PS Q is flanked and supported by two flat contact surfaces (left) so the two elapsed-seconds hands run in perfect unison. These contact surfaces were absent in the predecessor caliber CHR 27-70/150 (right), which resulted in small pendular movements.



The split-seconds pincers are open. The three teeth of the isolator lever have moved toward the side. The isolator wheel has again turned in the opposite direction. The isolator prong has moved toward the pivot point of the split-seconds lever. In this way, the front end of the little roller again sinks downwards. Connection to the split-seconds heart has been re-established. The chronograph's elapsed-seconds hand and its "catch-up" companion again run in synchrony.

the right of the roller. These supports function like the contact surfaces of the zero-return lever in a classic chronograph. A secure connection via the split-seconds heart is guaranteed when the two elapsed-seconds hands are moving simultaneously. With this simple but inventive solution, Patek Philippe has resolved one of mechanical watchmaking's longstanding problems.

The new Caliber CHR 29-535 PS Q has a total of 496 components, 272 in the base movement, 182 in the calendar mechanism, and 42 for the split-seconds mechanism with isolator. The movement is 8.77 mm thick.

The watch comes in a platinum case with a diameter of 40 mm. Like all Patek platinum timepieces, Reference 5204 has a flawless Top Wesselton diamond unobtrusively set between the lower lugs. Connoisseurs who appreciate absolute discretion will opt for the solid platinum back. The watch is also available with a transparent sapphire back for those who prefer a view of the movement.

PATEK PHILIPPE DOESN'T venture onto terra incognita with Reference 5204. Founded in 1839, this *manufacture* has made virtually every conceivable horological complication at least once in the course of its long history. The first split-seconds chronographs were pocketwatches. According to company archives, Patek Philippe's wristwatches entered the rattrapante era on Feb. 24, 1924, when watchmakers began work on movement number 198.000, a 13-ligne hunter caliber with a subdial for the seconds at 6 o'clock and a counter for 30 elapsed minutes at the 12. Its ébauche was supplied by the firm's longstanding partner Victorin Piguet. The movement contained 19 jewels and relied on a classic pincer mechanism with an additional column wheel to control the split-seconds hand. This timepiece was sold to Tiffany & Co. in New York on Oct. 7, 1924. The early wristwatch rattrapante models used a button in the crown to start the chronograph, to stop it, and to return its hands to their zero positions. The split-seconds mechanism was controlled via a button at 2 o'clock. These elaborate chronographs had cushion-shaped gold cases; their dials sometimes included tachymeter scales to measure average speeds.

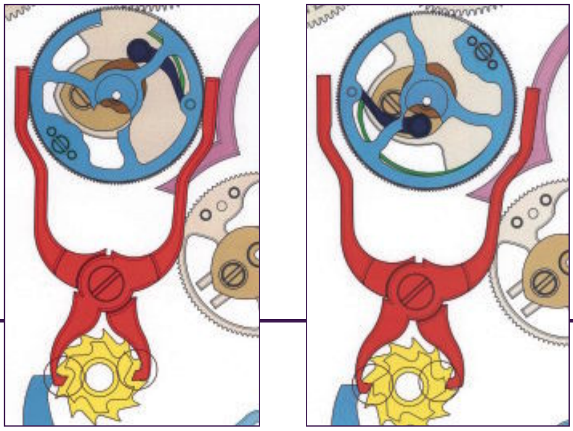
Watchmakers began working on movement number 198.012 on May 11, 1925. This was a comparable Victorin Piguet movement in so-called "Lépine" design, i.e., the running-seconds subdial and the 30-minute counter were collinear with the crown. The unusual feature of this timepiece, which was sold on Jan. 4, 1927, is that all its operating elements were on the left-hand side of its cushion-shaped case. These included a little slide between the crown and the split-seconds button, which was located at 8 o'clock. This slide enabled the owner, who was probably a southpaw, to block the chronograph function for added security.

The third model in this series (number 198.018, with round gold case no. 411.525) was shipped on Jan. 31, 1927 to New York, where Tiffany sold it with its own name on the dial.

Another rattrapante chronograph (movement number 198.076) began in a cushion-shaped gold case in 1927, but reappeared in a round case in 1935, perhaps because there was no buyer for it. It left the *manufacture* one year later. There were probably not more than a dozen of these very early split-seconds chronographs.

The economic upheavals that shook the world in the 1930s had a profound impact on Patek Philippe. A drastic decline in

HOW A CLASSIC SPLIT-SECONDS MECHANISM WORKS



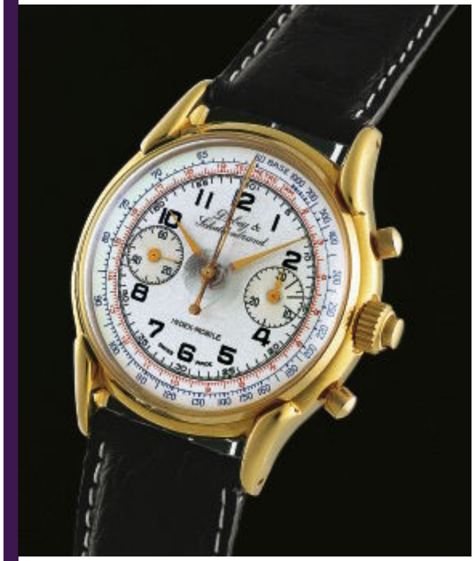
Split-second chronograph watches have in the center of the dial a pair of seconds hands to measure elapsed seconds. The additional seconds hand, which sits atop the principal elapsed-seconds hand, enables the timing of intermediate intervals of time – the laps of a car driving around a racetrack, for instance – within a longer period of time. When the chronograph is switched on, both hands begin to move, together, as if they were a single hand. When the first interval ends, the watch wearer stops the split-seconds hand, notes the elapsed time, and then restarts the hand, causing it to jump forward to catch up with the principal hand, which has been moving continuously since the chronograph was started.

This requires a fixed but flexible connection between the two hands. This connection shouldn't sap an unduly large dose of energy from the movement's mainspring and is therefore a very delicate one. The difficulties begin with drilling the very long hole through the staff of the chronograph's center wheel: this staff must be quite long because it extends through the entire movement. Furthermore, the bore hole must be extremely precise so that the even thinner, even longer, and extremely straight staff of the split-seconds wheel can turn with minimal friction inside the cylindrical opening. Any eccentricity or bend will interfere with its proper functioning.

Watchmakers screw the so-called "split-seconds heart" (colored brown in the illustration) to the rear of the chronograph's center wheel. This wheel later cooperates with the split-seconds wheel (pale blue), which is affixed to the split-seconds staff. The split-seconds wheel bears the split-seconds lever (dark blue), which has a little ruby roller on its free end. A slender steel spring (green) presses the split-seconds lever so firmly against the double-hand's heart that the ruby roller, because of its shape, rests in the little notch. This contact suffices to cause the split-seconds hand to rotate along with the chronograph's elapsed-seconds hand. An "X"-shaped pincers (red), controlled by a column wheel, stops the split-seconds hand. The finely toothed ends of these pincers act like a shoe brake. If the thicker parts on either side of this pincers rest atop pillars of the split-seconds column wheel (yellow), then the brake is released so the split-seconds hand and its companion rotate together.

When the user presses the rattrapante button, the column wheel turns and advances one position. The descent of the thickened parts between the columns closes the pincers (illustration on the left). The two arms press against the split-seconds wheel and thus stop the split-seconds hand. In this instance, the ruby roller runs along the circumference of the split-seconds heart. When the pincers reopen, the spring's pressure guides the roller into the notch in the heart, and the split-seconds hand catches up with the chronograph's elapsed-seconds hand (illustration on the right). As long as the chronograph is running, this interplay can be repeated as often as the user desires. Split-seconds constructions also exist with parallel pincers. The function is exactly reversed in this case: prongs that descend between the columns open the pincers.

A BRIEF HISTORY OF SPLIT-SECONDS CHRONOGRAPHS



Dubey & Schaldenbrand's Index Mobile

Winnerl's pocketwatch No. 495 (circa 1840). The flyback pusher is on the pendant.

Bovet's Mono-Rattrapante

Chronographs with a split-seconds or "catch-up" hand (French: rattrapante) are much rarer and more expensive than "ordinary" chronographs. In a split-seconds chronograph, the second elapsed-seconds hand can be stopped as often as desired and independently of its twin, enabling the user to measure intermediate times. After each intermediate interval's duration has been read, the stopped hand can be restarted and it speedily catches up with its counterpart (i.e., the chronograph's primary elapsed-seconds hand). Both hands can also be simultaneously returned to the zero position. All this requires an additional, costly mechanism, so the price of a rattrapante watch is generally about 50 percent higher than that of an ordinary chronograph.

The first rattrapante dates from 1827, when Louis-Frédéric Perrelet and his son were issued a patent for a split-seconds mechanism. Perrelet père et fils had connected two seconds hands at a single point of contact. The final arrangement is credited to the Austrian watchmaker Joseph Thaddäus Winnerl, who moved to Paris in 1829 and two years later developed the mono-rattrapante, which had a catch-up mechanism equipped with only one hand. A version with two seconds hands followed in 1838. A return-to-zero mechanism had not yet been invented.

Genuine split-seconds chronographs in pocketwatches first appeared in 1883. In 1921, Ralco SA, a sub-brand of Movado in La Chaux-de-Fonds, unveiled what was probably the world's first split-seconds chronograph in wristwatch form. Luxury brands including Patek Philippe followed suit several years later. The complex and laborious task of manufacturing a rattrapante, along with the consequent high price, dissuaded experienced ébauche manufacturers from producing split-seconds versions of common calibers. The first to do so was Valjoux, the industry leader, in movements measuring 39.3 mm in diameter (17 2/3 lignes). Smaller 14-ligne models were available from Venus, which made Caliber 179 (with elapsed-minute counter, 7.2 mm tall), Caliber 185 (with counters for elapsed minutes and elapsed hours, 8.55 mm tall), Caliber 189 (identical to Caliber 185, but with a pointer date display, 8.55 mm tall) and Caliber 190 (identical to Caliber 189, but including a moon-phase display, 8.55 mm tall). None of these calibers achieved widespread popularity. Nor did Bovet's Mono-Rattrapante, which debuted in 1936, or Dubey & Schaldenbrand's comparatively simple index-mobile construction (starting in 1946), in which a slender coiled spring, visible above the dial, caused the split-seconds hand to jump back.

It wasn't until 1988, when the mechanical renaissance was underway, that there was a noteworthy breakthrough. That's when Frédéric Piguet and Blancpain launched the caliber duo 1181 (hand-wound) and 1186 (automatic). In 1992, Chronoswiss, IWC and Ulysse Nardin each upgraded Caliber Valjoux 7750 with a split-seconds mechanism, and Breguet launched the 533 NT, based on a Lémania mechanism. A. Lange & Söhne introduced the Double Split (Caliber L001.1) in 2004: this was the world's first chronograph with split hands for both the elapsed seconds and the elapsed minutes.

Venus's Caliber 185 in a Record watch (ca. 1950) sales of luxury watches, especially in the United States, forced a change in ownership of the company. The brothers Charles and Jean Stern, owners of the Fabrique de Cadrans Stern Frères dial factory, who had a long and close business relationship with Patek Philippe, purchased the majority of the shares in the company in 1932. They hired as managing director Jean Pfister, director of the Geneva subsidiary of Tavannes Watch. The Sterns and Pfister decided that Patek Philippe should develop and produce its own in-house calibers. The decision, which would have far-reaching consequences, was initially limited to classic hand-wound movements in either tonneau or round cases. Patek Philippe's top brass wasn't quite ready to begin making their own base movement for chronographs. Nor was there a need to. Time-tested, precise and reliable hand-wound chronograph calibers were readily available from Valjoux SA, like the 13-ligne, 5.85-mm-high column-wheel caliber 23VZ, which was launched in 1916.

This movement underwent a thorough reworking and upgrading in accordance with the traditional philosophy of Patek Philippe, whose watchmakers used separate cocks to bear the escape wheel, the fourth wheel and the driving wheel. They also added a swan's neck fine adjustment mechanism to the regulator's pointer, gave an unusual shape to the chronograph bridge, and added the typical cover to the column wheel. They did the laborious work of completely redesigning the coupling yoke and giving it a bearing concentric with the staff of the fourth wheel, a solution already used in early Piguet calibers. This movement, which was hand-wound, combined a perpetual calendar with the split-seconds chronograph for the first time. It appeared in the legendary Reference 130, completed on Sept. 8, 1934. (The new owners also introduced Patek's system of identifying watch models by reference number, beginning the series with the number "96.") The 13-ligne movement, designated by number 198.393, came in a 34-mm diameter case, the standard size for that era. This extraordinary timepiece was sold on Feb. 14, 1938. Patek's archives show that the split-seconds movement (without the escapement) cost approximately 600 Swiss francs. The painstakingly finished set of parts for the escapement cost 124 francs. The perpetual calendar added 240 francs and the assembling another 250 francs. Patek Philippe manufactured a total of three watches of this type.

> *WHAT BEGAN IN 2009 WITH A MANUAL-WIND CHRONO BASE HAS CULMINATED IN THE 496-COMPONENT CHR 29-535 PS Q.*

Patek Philippe produced a number of split-second chronographs bearing reference number 1436. The exact number of split-second chronographs produced in the decades after the Sterns took over the company is not known. It is certain, however, that the total quantity was fewer than 200 watches and thus significantly lower than the number of wristwatch chronographs with perpetual calendars produced during this same period. An impressive 281 examples of the perpetual calendar watch Reference 1518 were built between 1941 and 1954.

SPECS

PATEK PHILIPPE SPLIT-SECONDS CHRONOGRAPH WITH PERPETUAL CALENDAR

Manufacturer: Patek Philippe, Chemin du Pont-du-Centenaire 141, CH-1228, Plan-les-Ouates, Switzerland

Reference number: 5204

Functions: Hours, minutes, small seconds, column-wheel chronograph with elapsed-seconds hand and jumping counter for up to 30 elapsed minutes; split-seconds function triggered by a button in the crown; perpetual calendar with day, month, leap-year cycle and day/night display in windows and date display in subdial at 6 o'clock, ultra-precise moon-phase display

Movement: Hand-wound caliber CHR 29-535 PS Q; diameter = 32 mm, height = 8.7 mm (including 1.65 mm for the perpetual calendar and 1.7 mm for the split-seconds mechanism); 496 individual parts (including 182 for the perpetual calendar and 42 for the split-seconds mechanism with isolator), 34 jewels, 65-hour power reserve, Gyromax balance with a frequency of 28,800 vph, Breguet hairspring

Case: 950 platinum, sapphire crystal; the solid platinum back can be removed and a threaded transparent back with a sapphire crystal inserted in its place; water resistant to 30 meters; Top Wesselton diamond between the lower pair of lugs; comes with corrector stylus made of ebony and 18k white gold

Strap and clasp: Matte, black hand-sewn alligator strap; folding clasp made of 950 platinum

Dimensions: Diameter = 40 mm, height = 14.19 mm

Price: $317,500

PARTLY BECAUSE OF THE appearance on the market of the first automatic chronographs in 1969, Valjoux terminated production of its hand-wound chronograph caliber 23 VZ in 1974. The stock of ébauches nonetheless remained large enough to

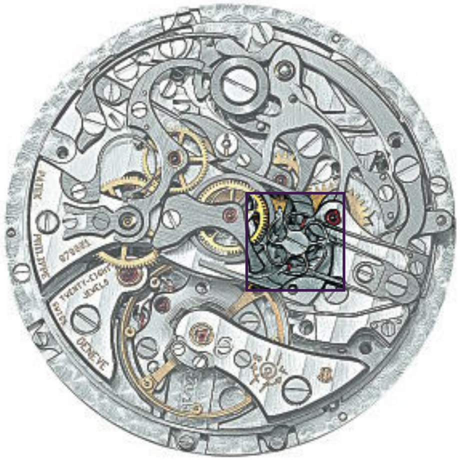
A COMPARISON OF THE TWO ISOLATORS:

Conventional isolator in caliber CH 27-70/150 ("octopus")

A conventional split-seconds isolator needs two oppositely acting springs. One of them is affixed below the split-seconds wheel; the other is attached above it. These two springs alternately control the connection between the split-seconds wheel and the chronograph's center wheel. This elaborate construction burdens the split-seconds wheel with additional moved mass, which in turn affects the balance's amplitude. Furthermore, the bearing for the chronograph's axle is also additionally stressed and the height of the movement must be increased.

Isolator in the new caliber CHR 29-535 PS Q

In Patek Philippe's new construction, only one spring, above the split-seconds column wheel and working in two directions, is needed. The new split-seconds mechanism is simpler to construct. Its principal advantage is that the weight of the springs is shifted from the split-seconds, which must be moved, to the static column wheel and the plate. This construction takes much of the load off the bearing for the chronograph's axle and makes the movement thinner than it would be with a conventional isolator.

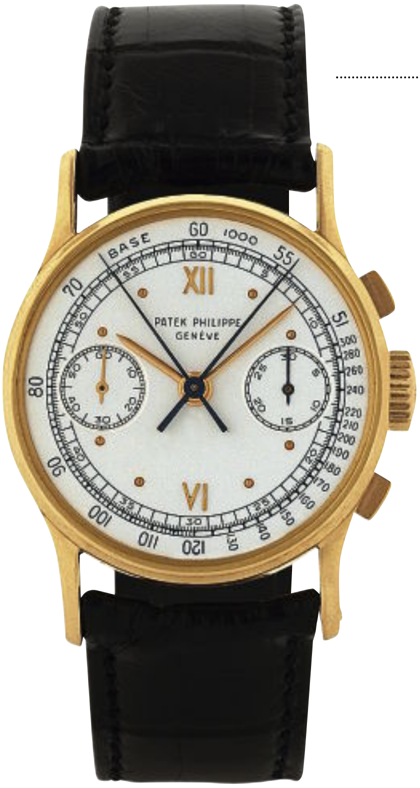


The so-called "octopus" isolator in caliber CHR 27-70/150

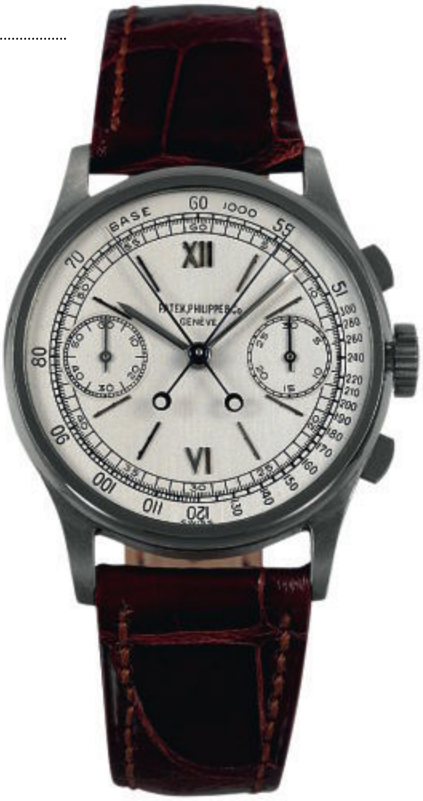
satisfy Patek Philippe's needs until the 1980s. When the ébauches ran out, Patek Philippe chose as its new supplier the renowned Nouvelle Lémania ébauche manufacturer. The agreement between Patek and Lémania regulated delivery of all basic components for caliber 2320, including the plate. Everything else was handled by Patek Philippe on its own premises in Geneva. Patek Philippe modified more than 60 percent of the components delivered by Lemania. Reference 3970, which had a chronograph and perpetual calendar, debuted at the Basel fair in 1986. Connoisseurs had to wait 10 years for the split-seconds version, Reference 5004.

That watch was powered by Caliber CHR 27-70/150, 8.86 mm tall and containing 404 components. The split-seconds mechanism, which was developed by the *manufacture*, included an unconventional component with a shape that strongly resembled the tentacles of an octopus. This so-called "octopus wheel" performed an important and innovative function. In ordinary mechanisms, the little ruby roller of the split-seconds lever continues to run around the split-seconds heart when the split-seconds hand is stopped. This saps energy and therefore reduces the balance's amplitude. Patek Philippe counteracted this not inconsiderable loss of energy by equipping caliber CHR 27-70/150 with an isolator. This component completely uncouples the split-seconds wheel from the chronograph's center wheel

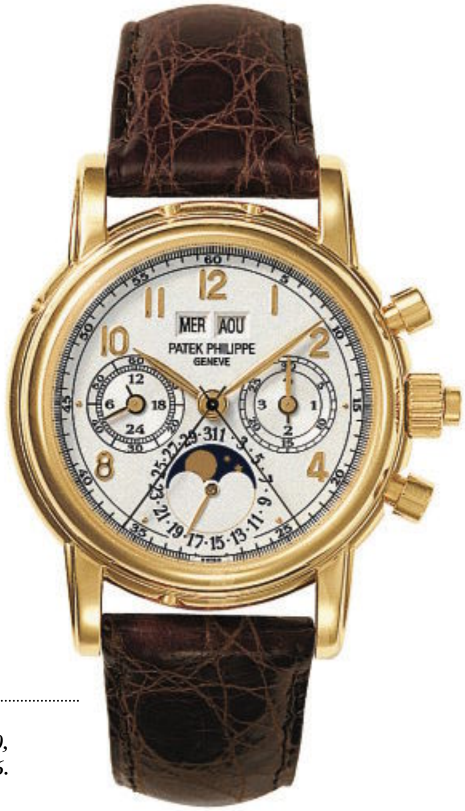
A Patek Philippe split-seconds chrono from the 1920s with movement by Victorin Piguet



Reference 1436, from 1950, in yellow gold (movement no. 867.847)



There are only four known surviving examples of Reference 1436, which was made in steel in 1945.



Reference 5004, with caliber CHR 27-70/150, was introduced in 1996.

when the split-seconds hand is stopped. To accomplish this uncoupling, the octopus wheel acts on an isolator wheel, which disconnects the split-seconds lever as soon as the pincer closes. The entire mechanism functions with the aid of two springs acting in opposition: one of them affixed under the split-seconds wheel, the other attached above it. These springs alternately open and close the connection between the split-seconds wheel and the chronograph's center wheel. Although this construction is complicated, it fulfills its task admirably. However, it increases the moved mass of the split-seconds wheel and necessitates an increase in the thickness of the movement.

These minor shortcomings didn't prevent Patek Philippe from regularly selling out Reference 5004's entire production, which totaled about a dozen units each year. A customer who wanted one had to wait several years for delivery – despite a steep retail price. Beginning in 2009, Patek Philippe gradually stopped using Lémania ébauches, ending this chapter in Patek's split-seconds history. ○

Photo: ZUCKERFABRIK FOTODESIGN

100 POINTS OF TIME

We take a close look at TAG Heuer's unusual Carrera Mikrograph 1/100, a watch with two separate escapements.

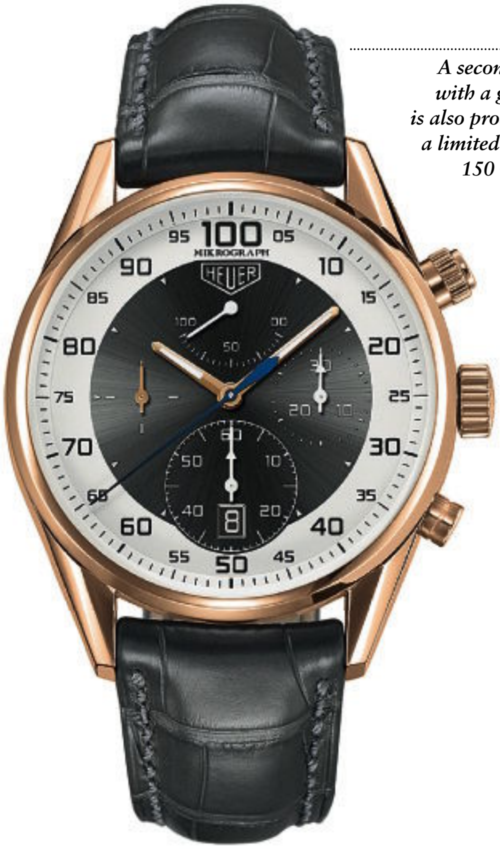
BY THOMAS WANKA

Pros

- + 1/100-second mechanical chronograph
- + Integrated *manufacture* movement
- + Very good daytime legibility for the chronograph
- + Easy-to-use crown
- + Attractive retro design

Cons

- – High price



A second model with a gray dial is also produced in a limited series of 150 watches.

In 1916, Heuer Watch Co. introduced a hand-held stopwatch that represented a quantum leap in mechanical watch accuracy. At a time when the most precise chronograph measured 1/5 seconds, the Heuer Mikrograph measured intervals of 1/100 seconds. The Mikrograph established Heuer as the world's leading producer of chronograph watches. Heuer's Mikrograph stopwatches were the official timekeeper for the Olympic Games from 1920 to 1928. These stopwatches, which had 57-mm-diameter cases, continued to be built nearly unchanged, with or without split-seconds hands, until the mid-1960s.

Last year TAG Heuer introduced a fitting successor to the original Mikrograph. The new Carrera Mikrograph 1/100 is the first mechanical wristwatch that uses a central sweep-seconds hand to measure 1/100-second increments. The Mikrograph is not the first mechanical watch to time to the 1/100-second. That honor belongs to TAG's Calibre 360 watch, introduced in 2006. For all its innovation (its chronograph module was made by La Joux-Perret and then added to an ETA 2892-2 movement), the rap on the Calibre 360 was that it was difficult to use due to the size of the display: 1/100s of a second are hard to read on the approximately 8-mm-wide subdial at 6 o'clock. Although this model was not designed for practical use, such as timing sporting events, it proved that a mechanical chronograph could measure 1/100s of a second. It was only a matter of time before TAG Heuer made a more practical model. The search for the Calibre 360's successor led to an entirely new construction that took five years to develop.

The man behind the watch is the physicist Guy Sémon. Formerly employed in the aerospace industry, Sémon is currently vice president of Sciences & Engineering at TAG Heuer and the director of its research division in La Chaux-de-Fonds, Switzerland. Together with watchmaker Denis Badin and engineer Janick Chatelain, Sémon constructed an integrated chronograph. This new movement powers the Mikrograph 1/100. A major feature of this watch is its two different balance wheels, with separate escapements and transmission systems that

SPECS

TAG HEUER CARRERA MIKROGRAPH 1/100

Manufacturer: TAG Heuer SA, 6A rue Louis-Joseph Chevrolet, 2300 La Chaux de Fonds, Switzerland

Reference number: CAR5040.FC8177

Functions: Hours, minutes, small seconds, 1/100-second central chronograph, counters for 60 elapsed seconds and 30 elapsed minutes, power-reserve display for the chronograph, date display

Movement: In-house Mikrograph automatic movement; 28,800 vph (4 Hz) for the watch, 360,000 vph (50 Hz) for the chronograph; 62 jewels; Incabloc shock absorber; flat Nivarox hairspring, Glucydur balance for the watch, Atokalpa balance for the chronograph; 42-hour power reserve for the watch, 90-minute power reserve for the chronograph; COSC-certified chronometer; diameter = 35.8 mm; height = 7.9 mm

Case: Rose-gold case; sapphire crystal; water resistant to 100 meters

Strap and clasp: Alligator strap with rose-gold pronged buckle

Dimensions: Diameter = 43 mm; height = 16.41 mm

Variations: Version with gray dial and gray leather strap, limited to 150 watches

Price: $50,000

allow you to run the chronograph without interfering with the watch movement. One balance, which oscillates at a speed of 4 hertz (28,800 vph), regulates the timekeeping movement, which has a 42-hour power reserve. The second balance, manufactured by Atokalpa, beats at a rate of 50 hertz (360,000 vph), and is responsible for the accuracy of the chronograph movement, which will run for a maximum of 90 minutes before needing additional energy. An arc-shaped scale, calibrated from 100 to 0 and positioned below 12 o'clock on the dial, shows the percentage of power remaining in the chronograph's barrel. The movement has two separate barrels, assuring that both the time display and the chronograph have enough energy.

The timekeeping movement and the stopwatch are integrated into a single caliber, but they work independently of each other. Each draws its energy from its own barrel, and the power from each barrel is transferred along a separate pathway. The barrel that keeps the watch running is replenished through the conversion of kinetic energy from the blackened rotor of the self-winding movement. The chronograph's barrel requires manual energy input, which is accomplished by turning the crown after it has been pulled out to its first position. The power-reserve display and a resistance that can be felt indicate that the device has been fully wound. The automatic movement can also be manually rewound by turning the crown counterclockwise. This means that the chronograph can continue to run after the watch has stopped and vice versa. This construction was necessary because even if the chronograph's balance were

A retro version of the Heuer logo is at the top of the dial. The chronograph's blued hand sweeps the dial to indicate 1/100s of a second.

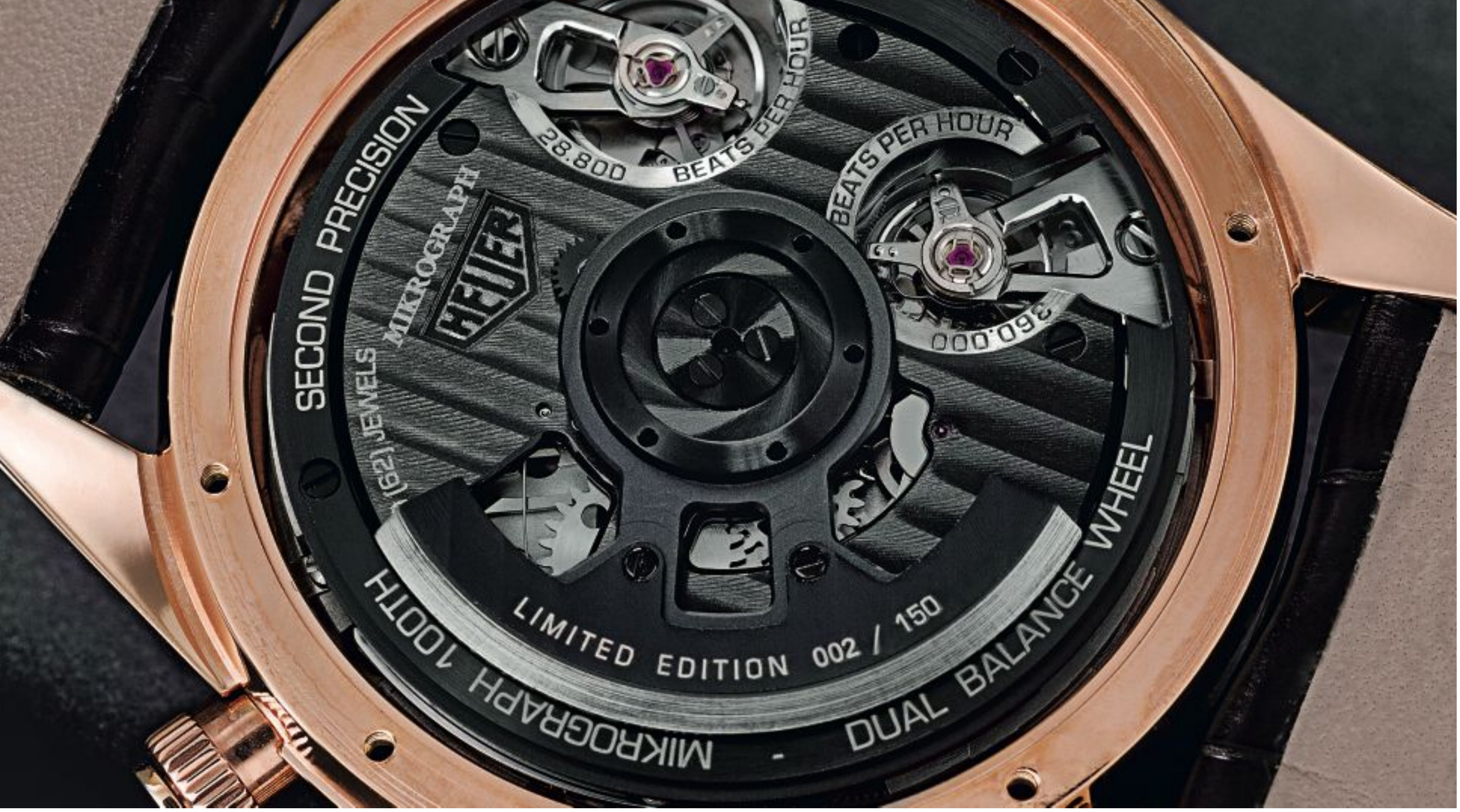
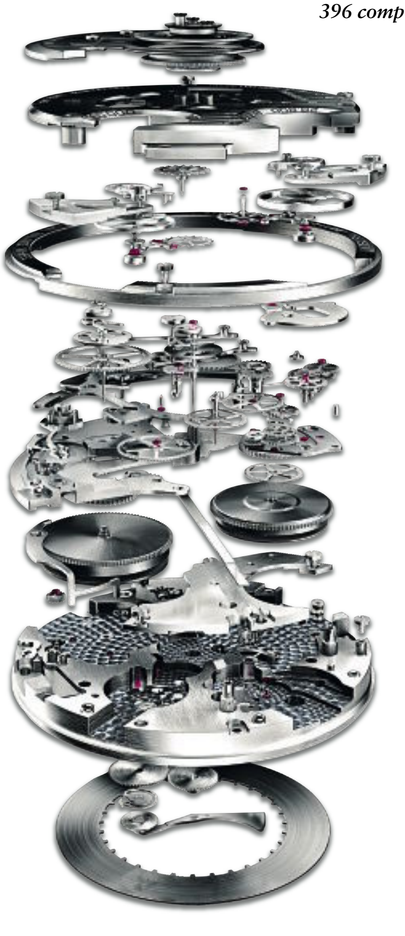


Photo: ZUCKERFABRIK FOTODESIGN

The balance for the watch and the balance for the chronograph are labeled with their specific frequencies. The blackened rotor is engraved with each watch's number in the limited series.

The large rose-gold case is water resistant to 100 meters.

An exploded view of the Mikrograph movement shows its 396 components.



designed to beat at a slower pace, coupling the stopwatch with the same energy flow that powers the watch would always cause the amplitude of the balance to decline abruptly and would detract from the accuracy of the watch.

To start the chronograph, you must first release the threading on the start-stop pusher. Even after speaking with the creators of the watch, it still isn't clear why they added threading to this pusher. One reason cited was aesthetics; the desire to protect the starting mechanism was another. Oddly enough, everyone agreed that water resistance was not a factor; the watch does not need the threading to achieve a water-resistance level of 100 meters.

As you would expect from a column-wheel chronograph, the elapsed-time measurement begins very smoothly and gently. The chronograph's actual start is nothing short of spectacular. The pressure point is quick and precise, minimizing the time between the decision to trigger the mechanism and its actual start. The slender, blued 1/100-second hand instantly begins racing around the dial, creating an audible hum, completing one full circuit every second. To the naked eye, this motion looks absolutely smooth and without any shudder. The seconds hand circles its subdial at 6 o'clock with similarly shudder-free regularity, although it requires a leisurely 60 seconds to complete each round. Only the counter for 30

TAG Heuer's Carrera Calibre 360 was the first mechanical wristwatch to time to the 1/100-second.

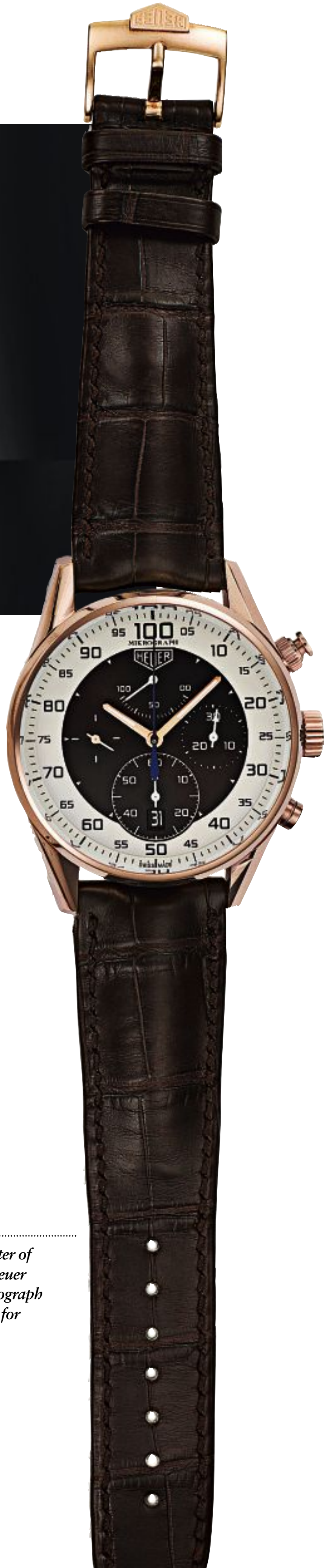
Heuer's Mikrograph of 1916

THE TIMEKEEPING MOVEMENT AND THE CHRONOGRAPH WORK INDEPENDENTLY OF EACH OTHER.

elapsed minutes at 3 o'clock makes a little jump once each minute.

The chronograph stops instantly when the pusher is depressed a second time. The elapsed 1/100s of a second are easy to read thanks to the calibrations around the dial. Large double-digit numerals mark each increment of 10 1/100s of a second and smaller two-digit numbers show five 1/100s. The elapsed seconds and minutes are also easy to read on their subdials. Of course, it's difficult for a mechanical watch to measure 1/100 of a second with extreme accuracy due to the time it takes to push the button. One way to measure the quickness of the wearer's reaction time is to try to stop the chronograph after it has been allowed to run for exactly 1 second.

The historical Heuer logo adds to the retro look of the dial. Two rose-gold hands, each coated with Super-LumiNova, show the time clearly, day or night. The continually running seconds hand, however, serves little purpose other than to show that the watch is still running. The large rose-gold case can be comfortably strapped to the wearer's wrist. The brown alligator strap, which matches the central dial, has a rose-gold pronged buckle engraved with the historical Heuer logo. The watch is produced in a limited edition of 150 pieces with a brown dial and strap and also in a limited edition of 150 with a gray dial and gray alligator strap. All the watches are COSC certified. ○



With a diameter of 43 mm, the Heuer Carrera Mikrograph 1/100 is sized for today's tastes.

PILOT PROJECTS

TAG Heuer's jet pilot turned physicist Guy Sémon is designing mechanical chronographs that measure time to the millisecond and beyond.

BY MIKE DISHER

In January 2004, TAG Heuer was desperate. It planned to debut its new concept watch, the Monaco V4, at the upcoming Basel fair, and the watch was not working. Much was riding on the new concept. CEO Jean-Christophe Babin was counting on it to establish TAG Heuer as a developer of cutting-edge, avant-garde mechanical movements.

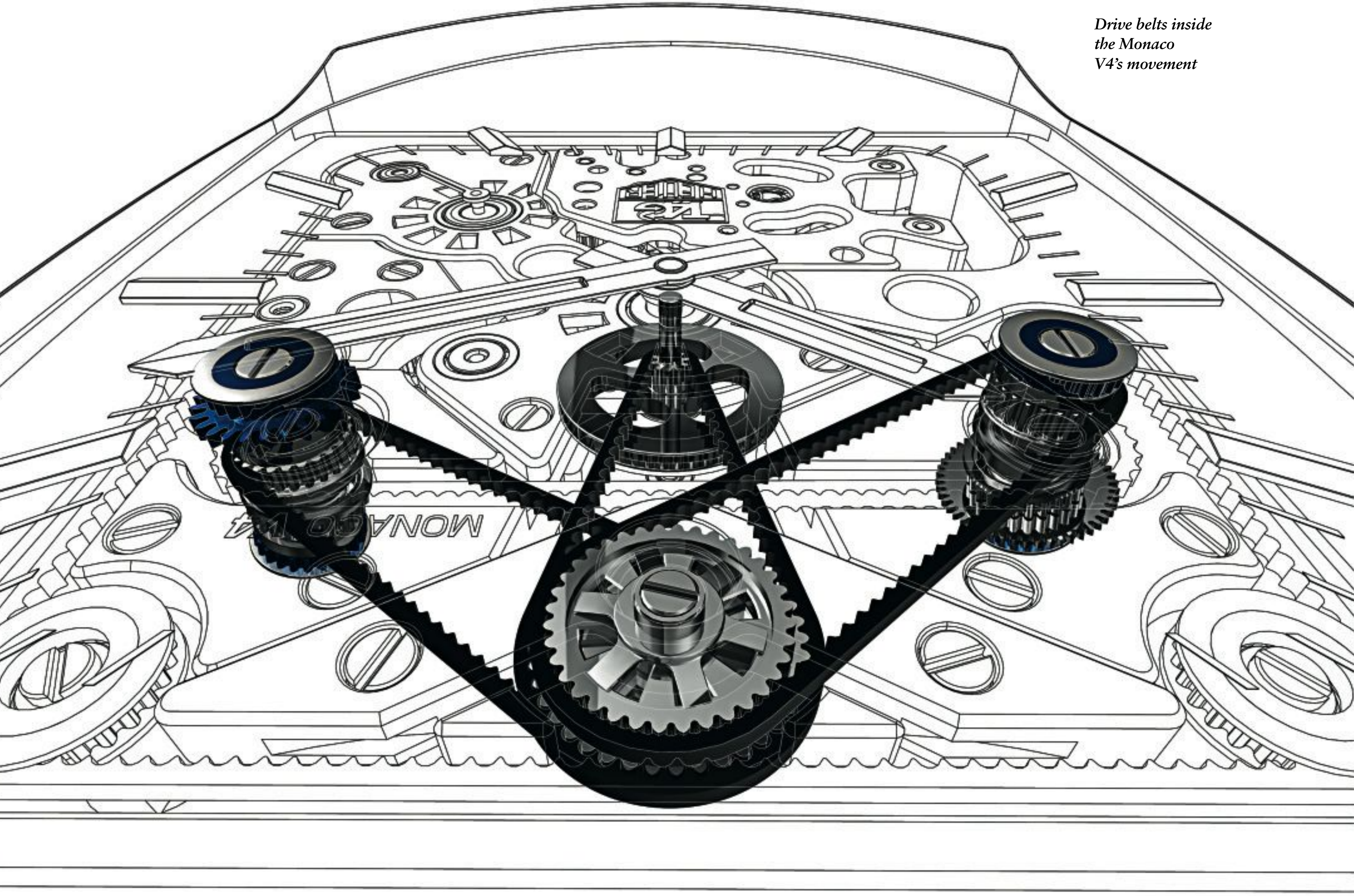
In the meantime, the V4's designer, Jean-François Ruchonnet, was making a business trip in Switzerland aboard a private jet, owned and operated by a small Swiss company. His pilot was named Guy Sémon. During the trip, Ruchonnet received a call from Babin urging him to get the V4 working. In passing, Ruchonnet mentioned the problem watch to Sémon. To the designer's surprise, Sémon offered to take a look at the watch to see if he might help. "But you are a pilot," Ruchonnet said. So began TAG Heuer's introduction to the mind of Guy Sémon.

French by birth, Sémon graduated from the French Naval Academy with an engineering degree, then served in the French navy as an officer and jet pilot specializing in test flights. He continued his career as an engineer for the French Ministry of Defense, working on advanced jet fighter programs like the Dassault Mirage 2000. Sémon then attended university where he mixed Ph.D. studies in physics with engineering work. Following graduation, he became a university physics instructor. This is not the usual watchmaker's career path.

After a few years, Sémon left teaching to launch a company specializing in flight simulation, an undertaking that drew on his impressive and eclectic skill set: test pilot, math and physics guru and aviation engineer. Sémon's company grew to employ 245 engineers and it worked closely with European manufacturers and with Lockheed-Martin in the United States.

In 2000, Sémon sold the company. Too young to retire, he became an engineering adviser to aeronautics companies around the world, with clients in France, Germany, the U.K., and Japan. So he could continue to fly, he also launched a small private aviation company in Switzerland, which is how he came to hear of the problem with the V4.

That problem was at once simple and complex: the watch's numerous drive belts (13 in all) caused too much friction. Sémon solved the dilemma with a Femtolaser – a laser that generates ultra-fast



Drive belts inside the Monaco V4's movement

pulses – located at a major French university: not a solution most watchmakers would envision. "It was not a problem of watchmaking," Sémon says. "It was a problem of physics. Watchmaking is mechanics, and mechanics is a branch of physics." Sémon used the exotic tool to craft extremely small belts from plastic.

The new belts – along with some movement tweaks – solved the problem. The first production Monaco V4 was sold at the 2009 Only Watch charity auction in Monaco. Today, the V4 is a commercial success. The first 150-piece limited edition in platinum, priced at 100,000 Swiss francs, sold out quickly. The next limited edition in rose gold, priced at $150,000, also sold out. The newest V4 limited edition is available now, in titanium, priced at $65,000.

At the end of 2007, TAG Heuer proposed that Sémon head up a new division within the company, to be called Sciences & Engineering. Sémon created the team, developed the tools, and identified new areas for innovation. The S&E group oversees TAG Heuer's research and development and haute horlogerie efforts. Today Sémon's department can manufacture 400 to 500 pieces per year in house. Sémon refers to it as "a small brand inside the company."

WITH THE V4 problems solved and the S&E group up and running, it was time for a new challenge, and Babin gave him one. He told Sémon, "We need to improve the technology inside the chronograph. You are free to choose your own direction."

The direction Sémon selected involved pursuing two apparently inconsistent goals: increasing the chronograph's frequency or speed so that it can measure ever-smaller fractions of seconds, and improving timekeeping accuracy while the chronograph is engaged. As Sémon explained, in a traditional chronograph movement, engaging the chronograph typically affects accuracy by reducing the balance wheel's amplitude. In watchmaking circles, the chronograph is known as a "heavy" complication because of its power requirements. So, creating super-fast chronographs would seem inconsistent with increasing timekeeping accuracy.

Sémon achieved both goals by using what he calls a "dual architecture" approach: incorporating two independent

SÉMON SOLVED THE V4'S FRICTION PROBLEM WITH A FEMTOLASER: NOT A SOLUTION MOST WATCHMAKERS WOULD ENVISION.

mainsprings, gear trains and escapements in the same watch. The escapements can operate at different frequencies, opening the door to watches with ultra-fast chronographs that do not affect timekeeping accuracy when they are activated.

To prove that the idea works, Sémon is pursuing the creation of a new timekeeping standard for chronographs, to be applied by the Contrôle Officiel Suisse des Chronomètres (COSC). To achieve the new standard, Sémon is working with scientists from the International Standards Organization, or ISO, with the observatory at Besançon (France's official timekeeper), and with COSC. (It is a common misperception that COSC establishes the guidelines that must be met to achieve chronometer certification. In fact, the standards are set by the ISO, and specifically, ISO 3159, which establishes the standard for chronometer certification. COSC tests movements to determine whether they meet ISO standards.) Sémon hopes to submit the first chronograph for the new certification in 2013. Once the standard is in place, any brand will be able to submit watches for testing.

THE "DUAL ARCHITECTURE" approach also allows Sémon to pursue his research in the area of ultra-fast chronographs. In traditional chronograph movements, a single escapement regulates both the timekeeping and stopwatch functions. This limits the chronograph to the more leisurely frequencies appropriate for timekeeping in a movement designed to operate continuously for years on end. A 4 Hz, or 28,800 vph, escapement may be fine for telling the time of day, but it limits the chronograph to 1/8-second increments. Sémon and his team are designing mechanical chronographs that can split seconds into 1/100-second and even 1/1,000-second and beyond.

Sémon's first fast chronograph – the Carrera Mikrograph – can time events to the nearest 1/100-second. Introduced in January 2011, it features twin barrels powering separate gear trains and twin escapements with different frequencies – 4 Hz or 28,800 vph for timekeeping, and 50 Hz or 360,000 vph for the chronograph. The central chronograph hand makes one full trip around the dial each second. The Mikrograph is being produced in a limited series of 150 pieces, priced at $50,000. (See the Mikrograph review in this issue.)

In March 2011 at Baselworld, TAG Heuer launched Sémon's second baby, the Mikrotimer Flying 1000, the world's first 500 Hz mechanical chronograph, capable of timing events to the nearest 1/1,000-second. Like the Mikrograph, it features separate mainsprings, gear trains and escapements for the timekeeping and chronograph functions. At 500 Hz, or 3.6 million vph, it is 125 times faster than a standard 28,800 vph chronograph. The central chronograph hand completes a full rotation around the dial 10 times per second.

Most people would call it a day af-

TAG Heuer's Mikrograph times events to the nearest 1/100-second.

The Mikrotimer Flying 1000 achieves millisecond accuracy.

ter launching two new high-frequency chronographs within two months, including the first to achieve 1/1,000-second accuracy. Not Guy Sémon. His latest super-chronograph is called the Mikrogirder, and its design is a revolution in chronometry.

To achieve something faster than 1/1,000-second, Sémon had to abandon classic escapement design because, he says, traditional balance wheels and spiral hairsprings are not capable of oscillating reliably at frequencies above 500 Hz. In a traditional escapement, the balance wheel oscillates back and forth somewhere between 270 and 320 degrees in a horizontal position. While higher speeds and smaller amplitudes are possible (with smaller balance wheels and stiffer hairsprings), traditional escapements were never intended to operate at extremely high frequencies. Their physical limitations meant a new design was needed. It was time to get out the proverbial clean sheet of paper.

Sémon's new design is inspired by the work of an 18th century French scientist, who, like Sémon, was a physicist and mathematician, not a watchmaker. During the 1740s, Jean le Rond d'Alembert published influential papers on the vibration of strings and wave equations, and his work still plays important roles in physics today. During his days as a university physics instructor, Sémon taught a class that included d'Alembert's work.

Sémon's new d'Alembert-inspired regulator consists of three very small metal blades (TAG Heuer also calls them "girders" or "beams") that can be induced to vibrate at high frequencies, and it represents a complete departure from the centuries-old balance wheel and spiral spring system.

THE MIKROGIRDER'S FREQUENCY IS 1,000 HZ, OR 7.2 MILLION VPH. TAG HEUER SAYS IT IS THE FASTEST MECHANICAL REGULATOR EVER CREATED AND TESTED.

The Mikrogirder has an escape wheel that turns and makes contact with two teeth on an anchor, but that's where any visual similarity to traditional escapements ends. The anchor excites the first of the three blades, called the exciting blade, which in turn excites the coupling blade, which excites the linear oscillator (also shaped like a blade). These three blades are mere millimeters long and small fractions of millimeters in diameter. The linear oscillator performs the same function as the hairspring in a traditional escapement, controlling the speed of the oscillation or vibration. In the prototypes we saw, the exciting blade is titanium, while the coupling blade and linear oscillator are steel.

As Sémon explains his new system, the energy of the escape wheel's rotation is converted into potential energy in the anchor and exciting blade. This sets up a vibration in the blades and linear oscillator. The escape wheel is like a finger plucking a guitar string (except the Mikrogirder does not generate an audible note). The Mikrogirder's frequency is 1,000 Hz, or 7.2 million vph. TAG Heuer says it is the fastest mechanical regulator ever created and tested. Explaining why he opted for 1,000 Hz, Sémon said, "I can cut 1,000 into two parts, and I can see for the first time the scale of 1/10,000s of a second. I can touch this scale for the first time in a mechanical system."

Just a Millisecond

The TAG Heuer Mikrotimer can measure to the 1/1,000-second. If you're wondering what you could possibly time with such a watch, read on.

1 millisecond (1 ms)
- Typical accuracy for a Network Time Protocol server used to synchronize time on computer networks
- Duration of light for typical photo flash strobe
- Time it takes for a sound wave to travel about 13.4 inches
- Time it takes for light to travel about 186 miles in a vacuum

1.4 – 10 ms
One rotation of an ultra-fast spinning pulsar

3 ms
A housefly's wing flap

3.3 ms
Normal delay time between initiation and detonation of a C4 explosive charge

4 ms
Typical average seek time for a 10,000 rpm hard disk

5 ms
A honey bee's wing flap

8 ms
Standard camera shutter speed (125)

32.4 ms
The shortest time it takes data to travel from New York City to London.

33.3 ms
The time one frame lasts in 30 fps video

50 ms
The time between gear changes on a Lamborghini Aventador

134 ms
Time it takes for light to travel around the earth's equator

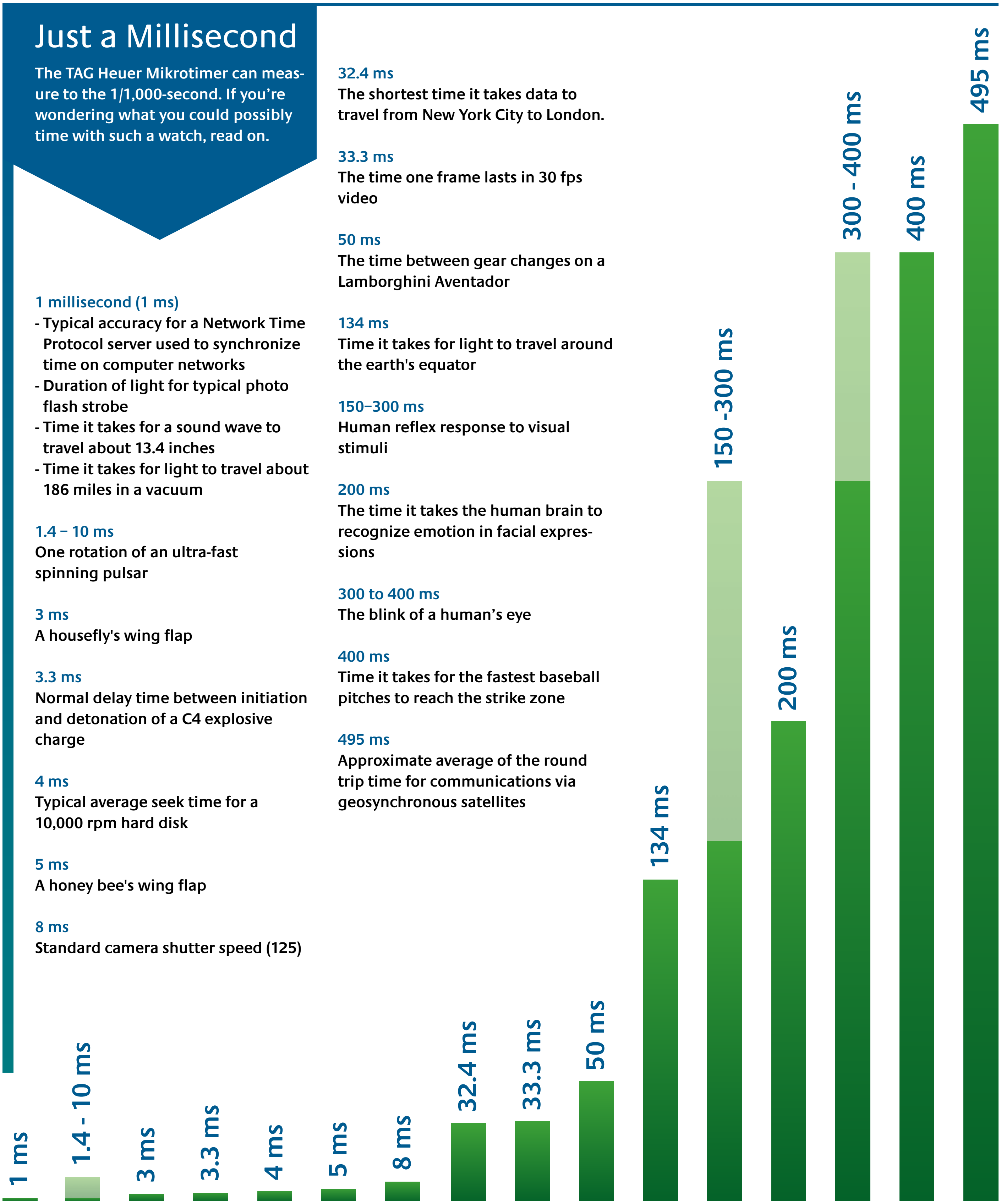
150–300 ms
Human reflex response to visual stimuli

200 ms
The time it takes the human brain to recognize emotion in facial expressions

300 to 400 ms
The blink of a human's eye

400 ms
Time it takes for the fastest baseball pitches to reach the strike zone

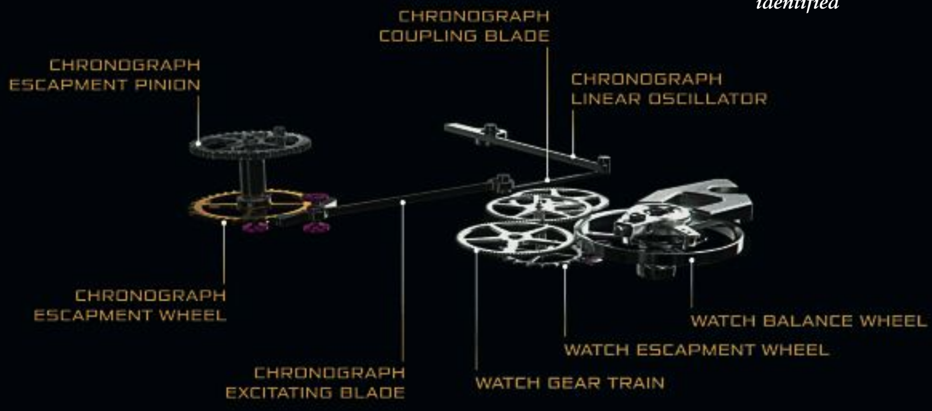
495 ms
Approximate average of the round trip time for communications via geosynchronous satellites



The new Mikrogirder. The "2000" at 12 o'clock proclaims its impressive resolution.

A dial aperture reveals the Mikrogirder's chronograph escapement.

The regular timekeeping and chronograph escapement components identified


CHRONOGRAPH COUPLING BLADE
CHRONOGRAPH ESCAPMENT PINION
CHRONOGRAPH LINEAR OSCILLATOR
CHRONOGRAPH ESCAPMENT WHEEL
WATCH BALANCE WHEEL
WATCH ESCAPMENT WHEEL
CHRONOGRAPH EXCITATING BLADE
WATCH GEAR TRAIN

Sémon says the new design oscillates very isochronously at a small angle - about 5 degrees at the linear oscillator. The Mikrogirder's regulator is also much less affected by gravity than a traditional escapement – TAG Heuer says there is no loss of amplitude in different positions. The benefits, TAG says, are a significant increase in precision (division of time) and performance (frequency accuracy and stability). Ten patents are currently pending on the new design.

The Mikrogirder's central chronograph seconds hand makes a full revolution around the dial 20 times per second – so fast that it can't be seen when the chronograph is running. The chronograph track around the periphery of the dial displays 1/1,000s of a second in 1/2,000 increments, up to 50/2,000. A 3-second totalizer appears at 3 o'clock, and a 90-second totalizer at 12 o'clock. The escape wheel, anchor, and excitating and coupling blades can be seen vibrating through an aperture in the lower left quadrant of the dial. A bold "2000" above the 90-second totalizer proclaims the Mikrogirder's impressive resolution.

If you're wondering whether it really works, the answer is "it appears to." TAG Heuer brought multiple Mikrogirder prototypes to our interview. The micro-girders could be seen vibrating through the dial aperture, and the central chronograph hand flew around the dial. Everything stopped, reset, and started again as it should. As to whether it was accurately measuring 1/2,000s of a second, we will have to await the verdict from COSC.

Asked about the Mikrogirder's current status and production timeline, Sémon said, "It is very easy to manufacture this kind of technology, but we need to continue to fine-tune the system. For the moment, it is very efficient at 1,000 Hz and we are able to validate our calculus. It is exactly where we want to be. Now it is probably necessary to invest one year, or perhaps two years of work to reach a commercial standard."

Not surprisingly, Sémon is already looking to the future. He believes his next chronograph will use a single blade rather than three. The blade-based regulator's next harmonic is at 3,000 Hz, but Sémon did not speculate about how fast he might go. He clearly wants to achieve 1/10,000 of a second, and physics, fortune and experience seem to be in his favor. ○

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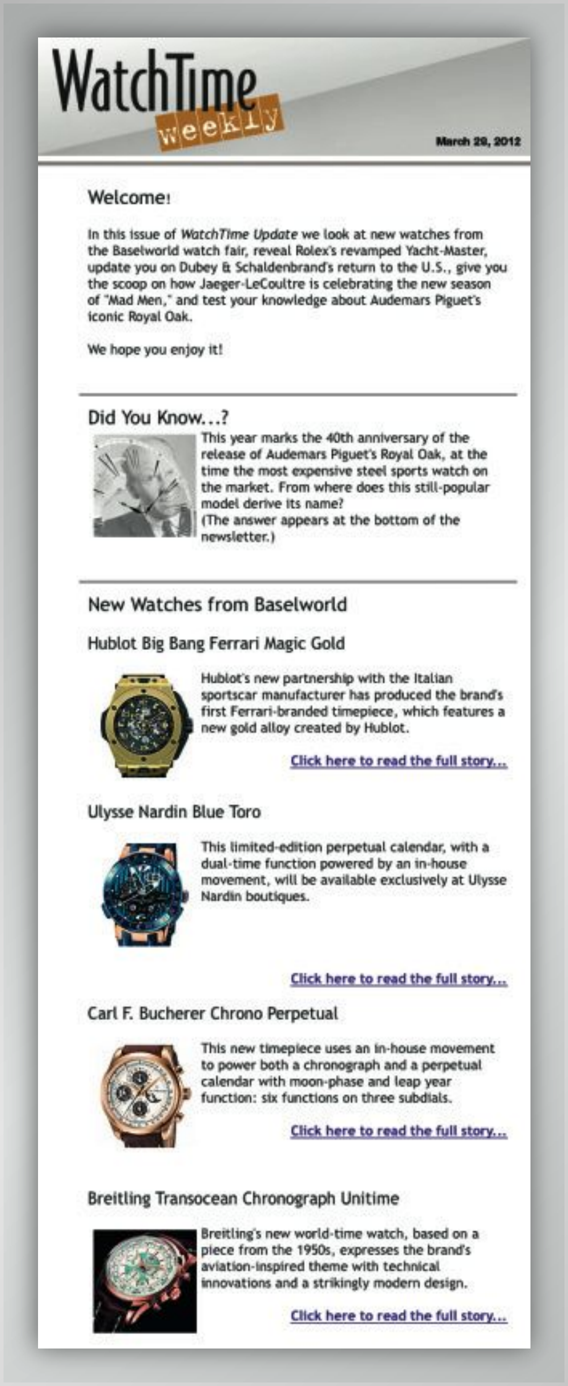

WatchTime weekly

March 29, 2012

Welcome!

In this issue of *WatchTime Update* we look at new watches from the Baselworld watch fair, reveal Rolex's revamped Yacht-Master, update you on Dubey & Schaldenbrand's return to the U.S., give you the scoop on how Jaeger-LeCoultre is celebrating the new season of "Mad Men," and test your knowledge about Audemars Piguet's iconic Royal Oak.

We hope you enjoy it!

Did You Know...?

This year marks the 40th anniversary of the release of Audemars Piguet's Royal Oak, at the time the most expensive steel sports watch on the market. From where does this still-popular model derive its name?
(The answer appears at the bottom of the newsletter.)

New Watches from Baselworld

Hublot Big Bang Ferrari Magic Gold

Hublot's new partnership with the Italian sportscar manufacturer has produced the brand's first Ferrari-branded timepiece, which features a new gold alloy created by Hublot.

Click here to read the full story...

Ulysse Nardin Blue Toro

This limited-edition perpetual calendar, with a dual-time function powered by an in-house movement, will be available exclusively at Ulysse Nardin boutiques.

Click here to read the full story...

Carl F. Bucherer Chrono Perpetual

This new timepiece uses an in-house movement to power both a chronograph and a perpetual calendar with moon-phase and leap year function: six functions on three subdials.

Click here to read the full story...

Breitling Transocean Chronograph Unitime

Breitling's new world-time watch, based on a piece from the 1950s, expresses the brand's aviation-inspired theme with technical innovations and a strikingly modern design.

Click here to read the full story...

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BABIN AT EASE

TAG Heuer's on-the-go CEO (and former aide-de-camp to Admiral Philippe de Gaulle) talks about his life, his career, and why he's not harried by the hairspring shortage.

BY NORMA BUCHANAN

At Jean-Christophe Babin's first real job, at Procter & Gamble, one of the rituals was a pre-dawn trip to a supermarket in suburban Paris. Outside the store's warehouse, he and a battalion of his competitors stood ready to rush inside as soon as the warehouse door was unlocked, pick up boxes of packaged soap, run into the store and, crouching in the home-products aisle, frantically place price stickers on as many packages as possible and place them on the shelves. The competition, he recalls, was fierce. "Next to me the guy from Colgate was trying to sticker his soaps quicker to fill in the shelf to gain shelf space," he says with a laugh.

It was good training for what lay ahead. Some 15 years later, in 2000, Babin became CEO of TAG Heuer following the brand's acquisition by LVMH, the world's largest luxury-goods company. Since then, he's been slugging it out with the likes of Rolex, Omega, Breitling, and an army of others. In the meantime, he has transformed TAG Heuer, the fourth biggest Swiss watch brand, by sharpening its identity as an innovator in chronographs, integrating the company vertically, and putting a new focus on mechanical models.

In April, *WatchTime* met with Babin at TAG Heuer's headquarters in La Chaux-de-Fonds. We found him tanned, rested – from a two-week vacation trekking in Nepal with his family – and ready to talk about his life before, and since, he entered the watch business.

BABIN, IT'S CLEAR, has always been a type-A type. He grew up in the town of Versailles, near Paris, and early on realized that the way to achieve his number-one goal – a brilliant career – was to attend a school known for producing them: the École des Hautes Études Commerciales (HEC) in Paris, then as now regarded by many as the best business school in France and perhaps in all of Europe.

He wasted no time there. At age 21, in 1980, he graduated with the equivalent of an MBA (the actual MBA degree did not yet exist in France).

In those days, military service was mandatory for men in France. Because Babin (pronounced "ba BAN") had attended one of France's so-called "grandes écoles," elite schools that accept just a small percentage of applicants (as opposed to the country's open-admissions public universities), he was automatically entitled to become an officer.

Graduates took an exam to determine what officer post they would hold: the top scorers got first dibs on the available jobs. Babin took the test with 79 others and got the second-highest grade. Fascinated by the Navy and by sailing (there were several naval officers in his family), he chose to become the aide-de-camp to the inspector general of the French Navy. The inspector general happened to be Admiral Philippe de Gaulle, son of Charles de Gaulle.

De Gaulle's job was to serve as a kind of check on the head of the Navy, with whom he shared equal rank. (France employs a system of checks and balances throughout its military in order to ensure that the heads of all the branches carry out their orders properly.) Both men reported directly to France's defense minister.

Babin sought out former Heuer CEO Jack Heuer to become the brand's honorary chairman and roving ambassador.

Babin's job was to serve as de Gaulle's personal secretary, to organize his trips, to arrange meetings or phone calls, including those with the French president and defense minister; to be what Babin calls "a kind of right arm" to de Gaulle.

It was a heady job. During his 15-month stint, Babin rubbed elbows with a slew of political and military bigwigs. He spoke with Ronald Reagan, during the 1981 celebration in Virginia of the bicentennial of the Battle of Yorktown, and flew on a private jet to that event with French president François Mitterand. He talked to de Gaulle's boss, the defense minister, many times.

The experience changed him forever, he says. "Quite early I was exposed to very high-ranking people, and came to realize that they were very normal. So it probably made me much more relaxed, much more daring," he says. "At 21 I could talk daily to the top-ranking admiral of the French Navy, equally with the defense minister and occasionally with the French president, and it probably meant 15 years of maturity. Subsequently, I've never been afraid of anyone. I've never been afraid to ask for anything."

Another benefit of the job: Babin got to travel with de Gaulle to the country's various territories in the Pacific and Caribbean. And he got to hear first-hand about recent French history from someone who had witnessed much of it. De Gaulle had gone with his father to Britain after the Germans occupied France and was by his side for much of what ensued. (Babin still keeps in touch with de Gaulle, now 90. The two exchange New Year's cards and Babin sometimes has a coffee with him when he visits Paris, where de Gaulle lives.)

De Gaulle asked Babin to stay on for another year, but Babin had other plans. His travels had ignited what would become a lifelong wanderlust. He and his girlfriend of the time spent a year backpacking in Asia. He supported himself with money he had earned while moonlighting as a magazine-advertising salesman during his stint with de Gaulle.

When he returned home he took a job with Procter & Gamble, considered to be the consumer-goods training ground non pareil for up-and-comers like him. He held both marketing and sales posts in several product categories, including detergents, cosmetics, soaps, shampoo and diapers.

Babin stayed at the company for five years, interrupted by a one-year honeymoon spent backpacking in Asia once again.

He then went to work for the Boston

"QUITE EARLY I WAS EXPOSED TO VERY HIGH-RANKING PEOPLE, AND CAME TO REALIZE THEY WERE VERY NORMAL."

JEAN-CHRISTOPHE BABIN

Consulting Group. "For me, consulting was a kind of post-MBA: I knew that I would discover a lot of different businesses, from different angles, but instead of paying for it, you get paid," he says. "I thought it was a good idea to take a break from consumer goods to determine what I wanted. I was just 28 and I had no idea. Maybe eventually finance would have interested me more, maybe the business of high technology, I had no idea."

He ultimately discovered that it was no fun coming up with detailed plans for improving a business and then handing them over to someone else to implement. So he left.

"Believe it or not, I went back to detergents," he says. Babin took a job with Mira Lanza, an Italian subsidiary of the Dutch household-products company Benckiser (now Reckitt Benckiser), and then moved to the German household-goods company Henkel. There, he was appointed senior vice president, the youngest in Henkel's history. As a final flourish, in pursuit of his assigned goal of increasing Henkel's business in the United States, he engineered the company's acquisition of Dial Corp., makers of Dial soap.

Babin at the 2005 introduction of the quartz Calibre S

AFTER SEVEN YEARS at Henkel, it was time to move on. Babin had just turned 40 and, except for his time at Boston Consulting, had known no business but consumer goods. "I realized that if I were to leave consumer goods and go to a totally different business, this was the right time."

Babin's wife worked at LVMH, and he knew from her that the company gave a great deal of freedom to its CEOs. So when the company offered him the CEO post for TAG Heuer, which it had just bought, he took it.

He had one thing in common with LVMH management: neither knew anything about the watch business. "LVMH discovered watches together with me, or I discovered watches with them," he says. The company sold watches under its Dior and Fred Joaillier brands, but it had no watch brands as such.

Its inexperience in the watch industry was an advantage for Babin, he says. "There were no sacred cows, no ideas about what was right or wrong."

Babin mapped out his strategy. First, he would trim the number of watch collections and focus on only the well-established ones. That meant getting rid of several quite similar collections of sports watches. He kept one, the 2000 series, and renamed it the Aquaracer. Another collection, the dressier S/el (for sports/elegance), was revamped and renamed "Link."

He also dropped the Kirium collection and the all-women's watch line Alter Ego, even though both were selling quite well. They were too far removed from the brand's core identity as a sports watch, Babin believed. "I made a bet that we would more than offset lost sales of the Kirium and Alter Ego by putting a major focus on more established styles," he says. Babin brought back the brand's least expensive collection, Formula 1, which had been discontinued in 1997.

The second part of his plan was to take two styles from the brand's history, the Monaco and Carrera, which had been treated merely as novelty items, used for occasional limited editions, and turn them into full-fledged, permanent collections: what he calls "pillars" of the brand. The move was in keeping with his belief that, to be successful, a brand needs permanent leader models that give it an identity. "If you take the strong brands – Rolex, Omega, Cartier, TAG Heuer – what do they have in common? They are stable. The Link, the Carrera, the Speedmaster, the Constellation, the Oyster, the Submariner, the Tank," he says.

Part three: Babin knew from his consumer-goods days that he needed a unique selling proposition for the brand. Heuer,

> *"LVMH DISCOVERED WATCHES TOGETHER WITH ME, OR I DISCOVERED WATCHES WITH THEM."*

as the company was known before its acquisition in 1985 by Techniques d'Avant Garde, was famous for its chronographs. They ranged from hand-held stopwatches to elaborate sports timers to the Chronomatic movement of 1969, one of the world's first automatic chronographs. Babin decided that chronographs, especially technically sophisticated, groundbreaking ones, would be the core of the brand. He brought out a series of splashy, high-mech timers that can split seconds into unprecedentedly small units. (See "Pilot Projects" in this issue.) All were designed to grab headlines and draw attention to the brand's chronograph expertise.

Babin sought out former Heuer CEO Jack Heuer, great grandson of Heuer's founder, Edouard Heuer, to discuss the brand's future. Heuer headed the company in the 1960s and '70s when it came out with a parade of technologically innovative chronographs, both mechanical and quartz. Babin named him honorary chairman and asked him to become a roving ambassador for the brand, a living link to the brand's chronograph heritage. (Babin gave one of his sons the middle name "Jack" in honor of Heuer.)

Part four of his plan: Seeing that mechanical watches were coming to dominate the men's luxury-watch market, Babin knew TAG could no longer be associated in consumers' minds chiefly with quartz. "We launched a full program to regain the leadership we had in the late 1960s in mechanical movements, with the focus on chronographs, but also with the Monaco V4," he says. (The Monaco V4 has an avant-garde mechanical movement that incorporates tiny belts in place of gears.)

Lastly, he took steps to integrate the company vertically. Before Babin joined TAG, the brand had been pooh-poohed in some circles for being no more than a marketing company, contracting with outside suppliers to make its watches and doing none of its own manufacturing. Now TAG has its own case maker, Cortech, and its own dial maker, Artecad, and is expanding its capacity to manufacture the 1887 chronograph movement. The number of employees working for the company in Switzerland has grown from 250 to 850 in

Springing Ahead

No Nivarox hairsprings? No worries. Jean-Christophe Babin is unfazed by the decision by the Swatch Group's Nivarox subsidiary to stop selling TAG Heuer escapement assortments, including hairsprings, the most difficult watch components to make. That's because Babin has secured a steady supply from two sources: the Japanese company Seiko, which developed TAG's 1887 chrono movement, and, on a smaller scale, the Swiss company Atokalpa, owned by the Sandoz Family Foundation.

Nivarox and TAG had a contract under which Nivarox would supply assortments for TAG's in-house chronograph movement, the 1887, launched in 2010. "The first term ended in 2011," Babin says. "Six months before, to our surprise, the Swatch Group put an end to the contract at the first contractual possibility."

Babin looked for other suppliers in Switzerland. "Absolutely no one was ready to supply tens of thousands of assortments, especially not in the quality we wanted," Babin says. The company that came closest was Atokalpa, which had developed the 360,000-beats-per-hour regulator for TAG Heuer's Mikrograph and also manufactured the regulator for the Mikrotimer. But even it couldn't make enough assortments to meet TAG's needs.

"We had two options, either to revise down our manufacturing ambitions for at least three or four years to what Atokalpa would have supplied us – 15,000 or 20,000 per year – or to stick to our plan, which was to go to 100,000 [in-house movements] very quickly and then to 200,000 in the next five to six years. But then we obviously needed a huge supplier. There are only two such suppliers worldwide: Nivarox and Seiko."

According to Babin, Seiko has agreed to sell TAG Heuer as many assortments as it will need in the coming years. Babin feels he can now rest easy.

But he isn't putting all his eggs in the Seiko/Atokalpa basket. "We're not giving up on the idea of one day making our own assortments, not to replace Atokalpa and Seiko but as a third source. Our requirements for mechanical movements are growing 20 percent or more per year, and at a certain point we will need so many assortments that we will not risk relying on just one or two sources." TAG Heuer might also buy a small maker of hairsprings, Babin says.

With supplies secure for the moment, TAG can wait to see what new developments occur in escapement technology before making any more decisions. "Assortments are at a crossroads," Babin says. The benefits of the new silicon components, being used by brands including Patek Philippe, Ulysse Nardin and Breguet, are still not entirely proven, Babin says. Other new materials might come into play, and entirely new regulating systems, such as the magnets in TAG Heuer's Pendulum concept watch or the vibrating blades in its Mikrogirder watch (see "Pilot Projects" in this issue), might become real alternatives to traditional escapements, he believes. "Now that we have secured a solution that gives us time, we will be able to assess what are the right assortments," he says.

Caliber 1887 in the Carrera 1887 Chronograph just five years, thanks largely to Babin's vertical integration.

MUCH OF HIS tenure has been tougher than he expected. For one thing, the competition is worse: there are more brands in the watch business than in others Babin has seen; some 200 active ones in Switzerland alone. "Before Christmas, you can count up to 40 brands advertising in a single [general interest] magazine. You won't find any other product like that," he says.

One reason, he believes, is that the watch business has been very easy to get into. "Until recently anyone could launch a watch brand with a few million dollars because you could subcontract everything," he says. You came up with a good idea, found the right third-party suppliers, and, if you had good relationships with the trade, you were in.

Distinguishing his brand from the others has also been harder than he thought it would be. A watch has so many mandatory components – a dial, hands, indices – that there isn't much room for improvisation, he believes. "The room for differentiating is very small and the constraints you have are many. I thought, naively, when entering the business, that it would be much easier."

Furthermore, the market requires constant technological innovation, a taxing proposition and, he believes, a paradox given that a luxury watch is supposed to be something one wears for decades.

He was also surprised by the speed with which watch brands rise and fall. "There are brands that were virtually nonexistent in the early 2000s, when I joined the company, and today they're super stars," he says. Hublot, also owned by LVMH, and the fashion brand Ice Watch, founded only five years ago, are just two examples of apparent overnight sensations. "Ice Watch did 3 million pieces last year," Babin says. The opposite is also true: "Some brands were extremely powerful and today they are dying. A strong brand can become a weak brand in three years. In consumer goods it takes ages."

Babin with TAG-sponsored actress Uma Thurman in 2006 ...

Babin has had a few major bloopers. In 2002, he introduced several models with gold cases, believing that because LVMH was a luxury-goods company, TAG should sell luxurious watches. Consumers didn't agree. "The brand image and reputation were probably not strong enough to sell gold. In a gold watch, the main cost is the gold, not so much the movement or the labor. So the more gold you use, the closer you are to Rolex in terms of price. And this works if your image somehow competes with Rolex. If your image is still too far away, which was the case in the early 2000s, obviously it's hard to sell gold. You can compete [in the gold-watch market] only when you have achieved a certain status level. Now we can sell gold, not as much as Rolex, but we are credible."

He stumbled again when he opened two ill-fated stores. One was in New York's SoHo neighborhood. "While visiting New York I discovered that there were no watch retailers in SoHo. It was very active and lively there on the weekends because the Madison Avenue stores were closed on Sundays. I thought that because there were no watch retailers there, that we would make a lot of money," he recalls. "But the reason there were no watch retailers there was that there was no watch business," he says with a laugh. "The boutique proved to be a disaster." Babin closed the store after two and a half years and took a massive write-off. He made a similarly costly mistake in London, opening a store in the wrong location. Eventually, Babin got the hang of retail. By the end of this year, TAG will have 60 boutiques worldwide, and 90 percent of them are doing well, he says.

HE HAS MORE to learn. One question is how to cope with a huge problem facing nearly all of the Swiss watch industry: the Swatch Group's cutbacks in sales of finished movements and movement components.

... and at the ground-breaking ceremony for the new movement-making factory in Chevenez this spring

Babin believes he has solved the component problem, or at least the knottiest part of it, by nailing down a reliable supply of escapement assortments to use in TAG's in-house movements (see sidebar). His challenge now is ensuring a steady supply of finished movements.

"THE TAG HEUER CHALLENGE IS TO GET TO 100,000 MOVEMENTS AND MORE."

He believes he can. He buys movements from Sellita, Switzerland's second-largest supplier of finished movements (the Swatch Group's ETA is, of course, number one). Even though Sellita does not have enough manufacturing capacity to fill orders for all the brands that need movements, TAG Heuer will get much of what it needs, Babin says. "[Sellita] will supply primarily those clients that have been supporting them from the very beginning. And there are two brands that have been extremely supportive: Breitling and TAG Heuer. We know that we will be on the 'A' list in terms of supply priority. Obviously, if I were on the 'C' list I would be much more nervous."

In the meantime, Babin is working to expand and improve TAG's in-house movement-making capability. In 2010, TAG introduced its first in-house movement, the 1887. Babin must now bring production costs down for both the 1887 and for the more expensive movements like those used in the Mikrotimer and Mikrograph.

TAG Heuer is planning to introduce another chronograph movement at the end of next year or the beginning of 2014 (Babin aims to unveil it at the next Basel-world show). Unlike the 1887, which has subdials at 6, 9 and 12 o'clock, the new movement will have them at 3, 6 and 9 o'clock. "We will have the two architectures that make up 100 percent of the chronograph market," Babin says.

All TAG's in-house movements will be manufactured at a new, 2,400-square-meter factory the company is building in the village of Chevenez in the Jura. The movement-component production that had taken place at TAG's Cortech facility in Cornol will be moved to the new site and all of Cortech's factory space will be dedicated to case making.

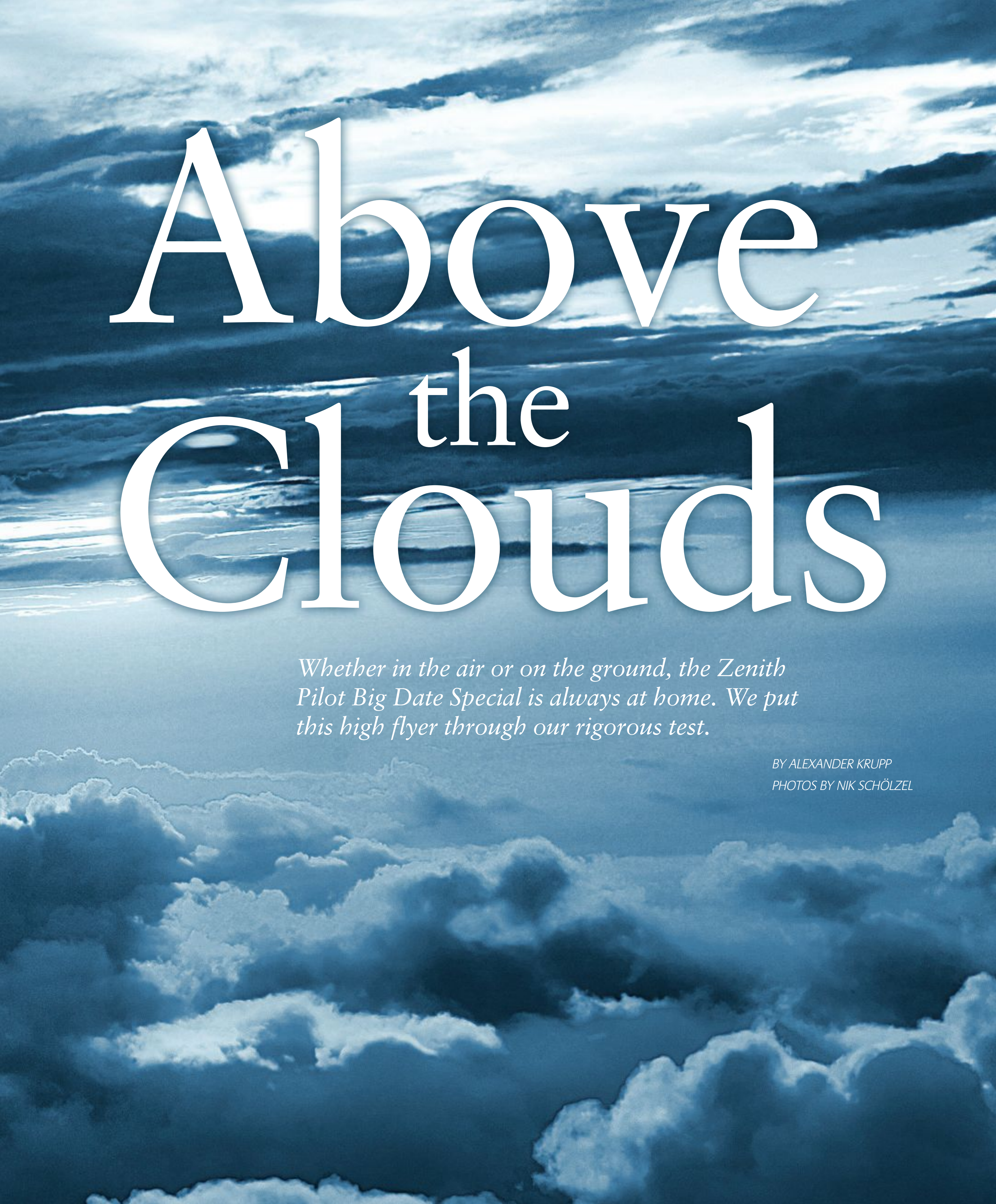
"The TAG Heuer challenge is to get to 100,000 movements and more," Babin says. Over time, the company will be able to cut production costs so that in-house movements no longer take an excessive chunk out of profits, he believes. Nonetheless, they will never be as cheap as ETA's: "Making it yourself costs more than buying from outside. That's for sure." ○

Pros

+ Nicely decorated in-house movement
+ Interesting design details
+ Consistent rate results
+ Good value

Cons

- Hard-to-read big date display
- No hack mechanism
- Simple pronged buckle



Above the Clouds

Whether in the air or on the ground, the Zenith Pilot Big Date Special is always at home. We put this high flyer through our rigorous test.

BY ALEXANDER KRUPP

PHOTOS BY NIK SCHÖLZEL

At the beginning of the 20th century, pilots' watches were essential tools for aviators. In 1909, the first aviator to cross the English Channel, Louis Blériot, used a Zenith wristwatch with a rotating minutes marker during his 37-minute flight. Shortly thereafter the first cockpit instruments came into use. Zenith equipped airplanes with altimeters and other aviation instruments that eventually made pilots' watches unnecessary. Zenith was also a major supplier of temperature-resistant and anti-magnetic aircraft clocks in the 1930s and '40s.

Today, pilots' watches serve as emergency backup instruments for recreational aviators. But, of course, most pilots'-watch fans aren't pilots at all, but earthbound types who like the watches' distinctive styling.

The Zenith Pilot Big Date Special combines the historical, functional design of a pilots' watch with several new elements. The watch has typical pilots'-watch features: a black dial to limit light reflection, luminous displays, satin finishes on the case, and a calfskin strap with contrasting white stitching. However, Zenith has made some interesting changes to the dial. Unlike a classic pilots'- watch dial, the dial of the Zenith Pilot Big Date Special features several finely calibrated tracks and incremental markers between the minutes indices. The numeral 12 appears in place of the usual triangle with two dots.

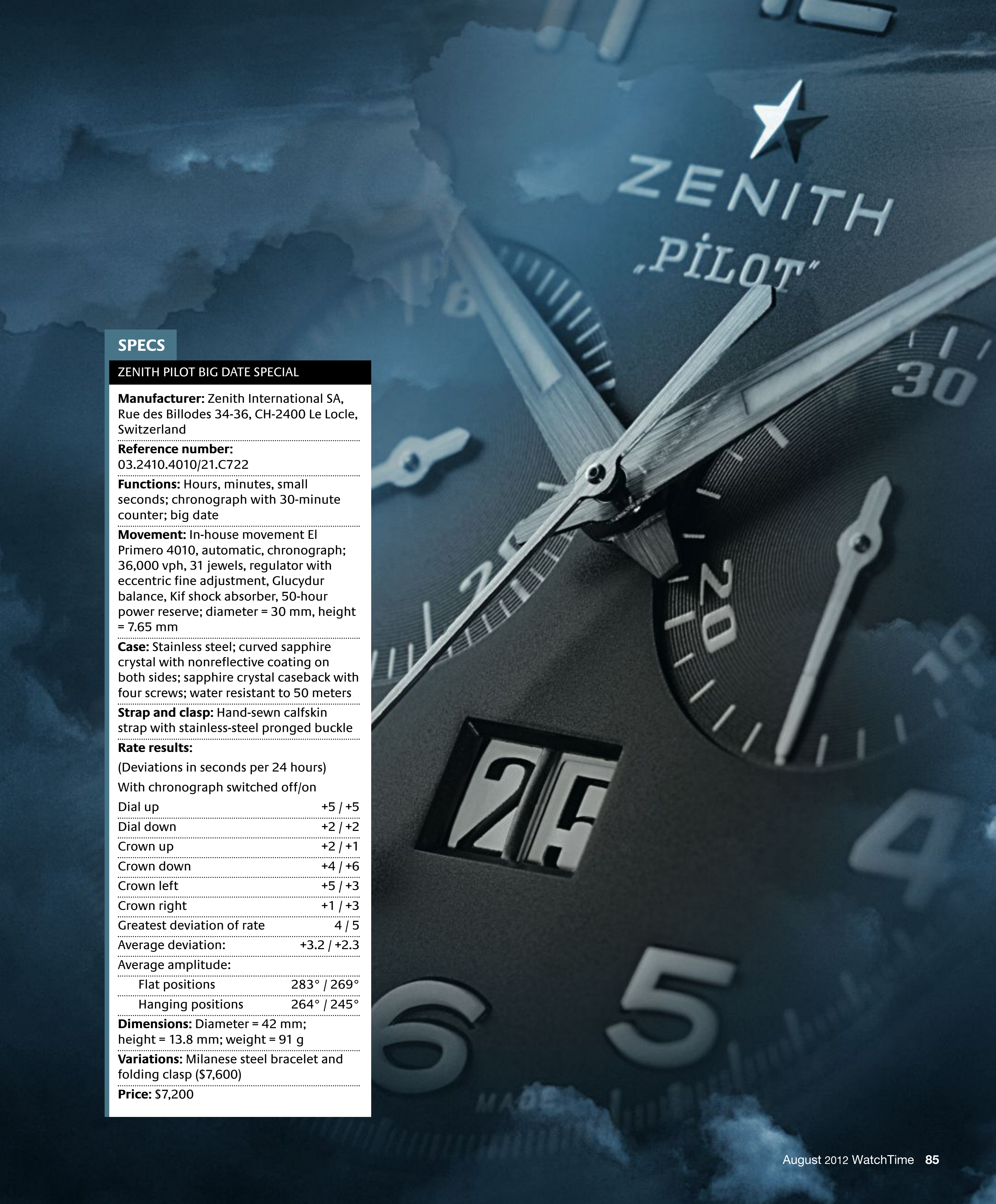
The watch has more features than a traditional pilots' watch. In addition to the time display, the watch has a chronograph, a patented big-date display and a telemeter scale, which calculates distances by using the speed of sound. You can start the chronograph when you see a bolt of lightning and stop it when you hear the thunderclap – the chronograph seconds hand will show how far away the storm is in kilometers.

As on many Zenith watches, the date display, rather than the hour counter, is at the 6 o'clock position. To make the two large date disks as compact as possible, Zenith has placed them very close together and uses the right disk for the tens digit rather than the left one (see photo detail on the next spread). The tens disk has rectangular openings through which the single digits can be seen. The design is clever but it doesn't solve the age-old problem of having the disks on different levels, which allows shadows to fall on the lower disk, making it hard to read. (Several other watches in Zenith's collection use big-date displays in which both numerals are on the same level.)

The date numerals on the Pilot Big Date fill the openings so fully that they almost touch the edges. They tend to blend in with the black dial, which also makes the date difficult to read. In addition, the right digit on our test piece was always slightly misaligned. And purists might find fault with the different styles of type used for the date and the other numerals on the dial.

The most important added function this watch offers is a chronograph, which is based on the renowned El Primero caliber. The minutes counter, which is easy to read, is at 3 o'clock. However, it's harder to read the chronograph seconds hand because the seconds markers and partial-seconds markers are a little difficult to tell apart. This is especially true at

THE PUSHERS ARE EASY TO USE, BUT THERE IS A NOTICEABLE JUMP WHEN THE CHRONOGAPH'S SECONDS HAND IS STARTED.



SPECS

ZENITH PILOT BIG DATE SPECIAL

Manufacturer: Zenith International SA, Rue des Billodes 34-36, CH-2400 Le Locle, Switzerland

Reference number: 03.2410.4010/21.C722

Functions: Hours, minutes, small seconds; chronograph with 30-minute counter; big date

Movement: In-house movement El Primero 4010, automatic, chronograph; 36,000 vph, 31 jewels, regulator with eccentric fine adjustment, Glucydur balance, Kif shock absorber, 50-hour power reserve; diameter = 30 mm, height = 7.65 mm

Case: Stainless steel; curved sapphire crystal with nonreflective coating on both sides; sapphire crystal caseback with four screws; water resistant to 50 meters

Strap and clasp: Hand-sewn calfskin strap with stainless-steel pronged buckle

Rate results:

(Deviations in seconds per 24 hours)

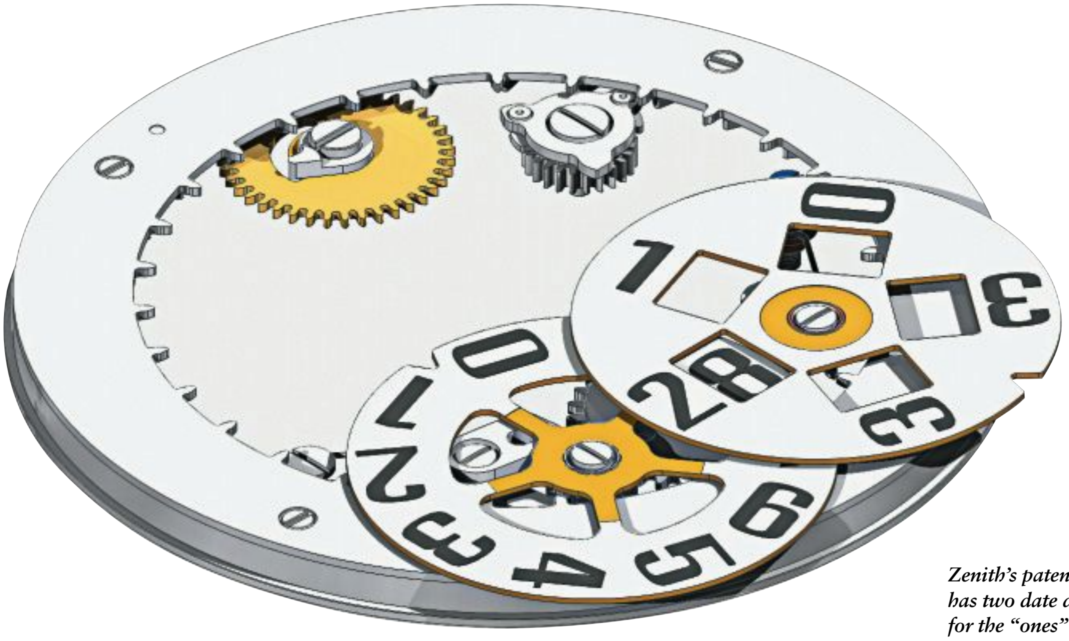
With chronograph switched off/on

Dial up	+5 / +5
Dial down	+2 / +2
Crown up	+2 / +1
Crown down	+4 / +6
Crown left	+5 / +3
Crown right	+1 / +3
Greatest deviation of rate	4 / 5
Average deviation:	+3.2 / +2.3
Average amplitude:	
Flat positions	283° / 269°
Hanging positions	264° / 245°

Dimensions: Diameter = 42 mm; height = 13.8 mm; weight = 91 g

Variations: Milanese steel bracelet and folding clasp ($7,600)

Price: $7,200



Zenith's patented big date display has two date disks. The openings for the "ones" digits are visible through the dial aperture.

the bottom of the dial, where the seconds markers were shortened to accommodate the words "Swiss Made." The incremental markers are essential for El Primero watches because they show the high oscillating frequency of this movement – 5 hertz, instead of the usual 4 – which enables the watch to measure increments to the 1/10-second.

The central hour and minutes hands can also be difficult to read: the narrow ruthenium-coated hands do not offer enough contrast with the matte black dial. The time is actually easier to read in the dark, thanks to the Super-LumiNova that covers the hands partially and the hour numerals completely. The material glows with an intense green color all night. The subdials remain dark.

The case is quite attractive, due in part to the polished facets on its lugs, a recessed area for the crown, and polished, shaped pushers. The spaces between the lugs are also polished.

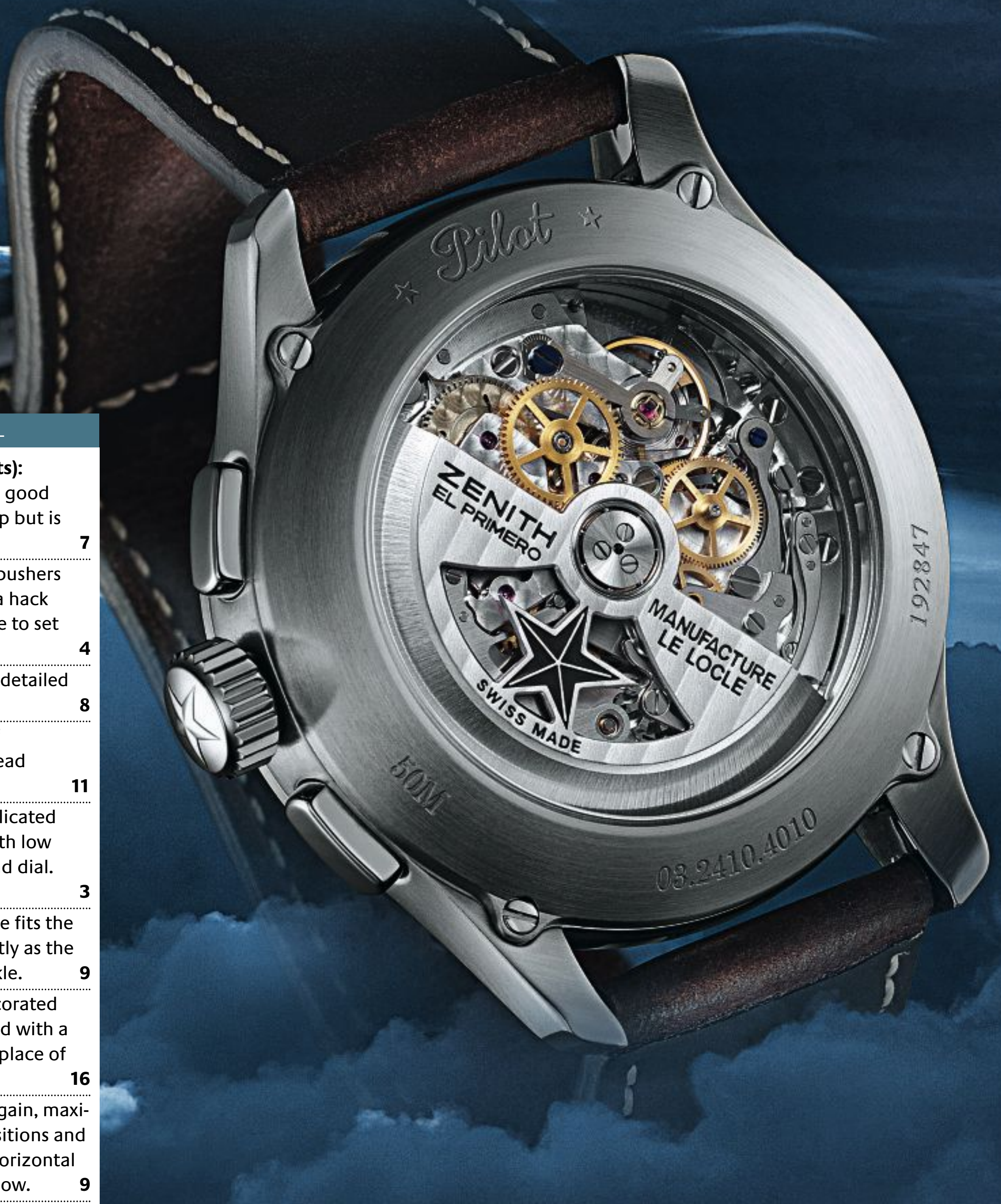
The finishing process for the lugs requires an additional step. At the point of transition from the sides to the back, any sharp edges on the lugs are rounded off. On the watch we tested, these areas appeared slightly irregular, but this merely indicates that the process was done by hand and should not be seen as a flaw.

The pushers are easy to use, but there is a noticeable jump when the chronograph's seconds hand is started. Resetting both chronograph hands with the bottom pusher works smoothly.

You can pull the large fluted crown out easily without using your fingernail. The crown turns comfortably. (With an El Primero movement, unlike with most, you set the time at the first pulled-out position and the date at the fully extended position.) The only drawback is the lack of a hack mechanism. When you pull out the crown, the small seconds at 9 o'clock continues to run. This makes it impossible to set the time exactly.

Like the rest of the watch, the strap combines good design and attractive details. What you notice first is that the strap has been treated to appear well aged. Light and dark areas over the brown calfskin leather give the appear-

THE TIME IS ACTUALLY EASIER TO READ IN THE DARK, THANKS TO THE SUPER-LUMINOVA ON THE HANDS AND NUMERALS.

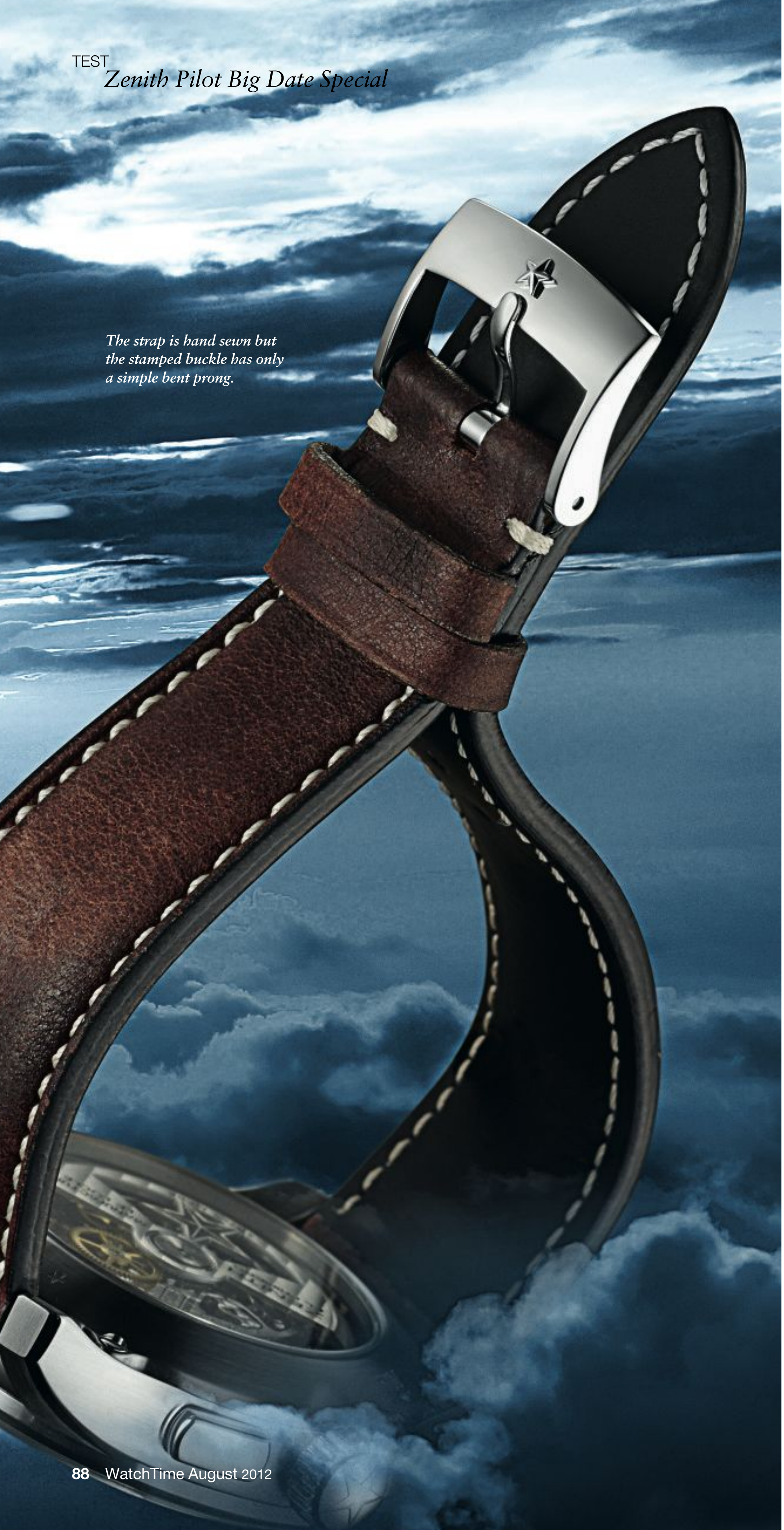


The El Primero 4010 chronograph movement is visible beneath a perfectly sized sapphire caseback.

SCORES

ZENITH PILOT BIG DATE SPECIAL

Strap and clasp (max. 10 points): The simple pronged buckle is a good match for the nice calfskin strap but is not well finished.	7
Operation (5): The crown and pushers are easy to use but the lack of a hack mechanism makes it impossible to set the time precisely.	4
Case (10): The case has a nicely detailed design and solid finishes.	8
Design (15): Pleasing variety of attractive details but hard-to-read big date display	11
Legibility (5): Numerous complicated displays are difficult to read with low contrast between the hands and dial. Legibility is better at night.	3
Wearing comfort (10): The case fits the wearer's wrist almost as perfectly as the supple strap and pronged buckle.	9
Movement (20): The nicely decorated classic movement was improved with a big date display that takes the place of the hour counter.	16
Rate results (10): The average gain, maximum deviation in different positions and amplitude drop between the horizontal and vertical positions were all low.	9
Value (15): The watch is well priced for a *manufacture* chronograph with a big date display	13
TOTAL:	**80 POINTS**



The strap is hand sewn but the stamped buckle has only a simple bent prong.

ance of a patina. Under closer examination, we noticed other features that we liked. The strap is attached to the case with heavy and very sturdy spring bars. It is hand sewn and has moisture-resistant rubber underneath that will greatly extend its life. Its separate layers are fully glued to ensure that no wrinkles form when the strap is bent. However, the varnish on the cut edges of our test watch's strap began to flake off at the transition to the top layer after only a few days. (This did not occur during any of our previous Zenith watch tests.)

We also found that the simple, stamped buckle was not well finished. We don't mind a pronged buckle, but this one could have been constructed with a bit more detail. First, we would have liked to see a milled prong instead of simply bending the metal around the spring bar. The nicely polished finish on both sides of the buckle is attractive, but a satin-finished or matte buckle would have been a better match for the matte finish of the case.

While the execution of the strap and clasp is not perfect, the wearing comfort of the watch is very good. The strap is sturdy but supple and the clasp lies flat against the wrist.

Looking at all of its features, we like the Zenith Pilot Big Date Special and found minor flaws rather than any major faults. Its strength lies in the collection of many appealing details, from the watch itself to its strap. A further advantage is its good value – we would expect a Swiss *manufacture* chronograph with a big date to cost more than $7,200, the price of this watch. ○

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JOURNE'S JOURNEY

BY IRIS WIMMER-OLBORT

François-Paul Journe made a tourbillon watch at age 24. Six years later came his Breguet-style Pendule Sympathique. And he was just warming up.

François-Paul Journe's discovery of watchmaking took an unusual path. His first encounter with the craft came while he was a teenager at vocational school in Marseille, France. There he saw sketches hanging in the halls labeled with the word *échappement*. Since *échappement* can mean either the escapement of a mechanical watch movement or the exhaust from an automobile, Journe looked at these drawings and wondered where the car's exhaust could possibly escape. But his initial confusion soon became a consuming passion.

Today Journe is a youthful 54-year-old who ranks among the most talented watchmakers of our time. Inspired by the master watchmakers of the past, he appreciates high complications and uses them to tell new and unique stories of his own. He bursts with fresh ideas and ingenuity.

But before he discovered his gift as a watchmaker, Journe was a schoolboy bored with his studies. At age 14, he transferred to a vocational school that offered classes in watchmaking. This is where he first encountered an *échappement*.

Apprentice watchmakers at Journe's school spent their first year learning to make the tools of their trade. Only after he began working with watch movements themselves did he begin to enjoy the craft, but this encounter, too, occurred in an unconventional way. "When we were given the task of disassembling watch movements, my classmates meticulously sketched every component so they would know how to reassemble the caliber afterwards. I've never been fond of sketching, so I didn't do that," Journe recalls. "All of the individual parts of the movement lay in a heap on my worktable. That compelled me to search for the exact position for each and every component. Sometimes it took me hours to find the right location. But in the process, I discovered that this was the best way for me to understand the device."

After two years at the Marseille school, Journe moved to Paris and completed his training at the city's school of watchmaking. Yet he learned the most not during the school day, but during the afternoons he spent helping restore antique timepieces in his uncle's workshop. This is where the young watchmaker discovered what he still refers to as the "golden age of watchmaking," the 18th century. Journe is fascinated by the creations of old masters such as Abraham-Louis Breguet and Antide Janvier, maker of planetary clocks.

> *"I COULDN'T AFFORD TO BUY A TOURBILLON, SO I DECIDED TO MAKE ONE."*
>
> *FRANÇOIS-PAUL JOURNE*

"I also adored tourbillons," Journe says. "Naturally, I couldn't afford to buy a tourbillon watch, so I decided to make one." It took him five years to build this demanding complication in his spare time. "I didn't have a model to study, so I had to learn by poring over diagrams and sketches in very old books," he says. Journe completed his project in 1982, at age 24. At this time he also finished his craftsman's apprenticeship and began to attract the attention of his uncle's clients, who admired his skill. Soon after seeing his tourbillon, they began hiring him to create watches. "Collectors asked me to build watches for them. And I've never stopped," Journe says.

Journe spent six years developing Caliber 1505, used in the Sonnerie Souveraine.

Journe's company, based in Geneva, employs 65 watchmakers, micromechanics and other specialists.

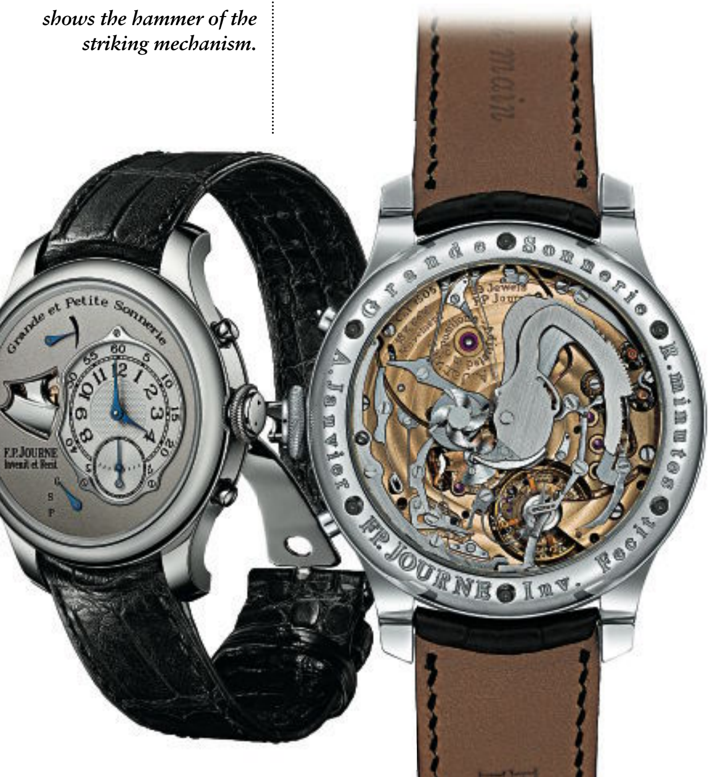
He set up his first atelier in the mid-1980s in Paris. He went on to construct highly complex one-of-a-kind timepieces commissioned by connoisseurs. He built one timepiece each year until 1988, and each of them is unique.

He was then drawn to Switzerland. Together with partners, he founded a firm in Sainte-Croix named THA (Techniques Horlogères Appliquées). But the collaboration didn't work out the way Journe expected, and in 1989, he relocated to Geneva and began building watches of his own.

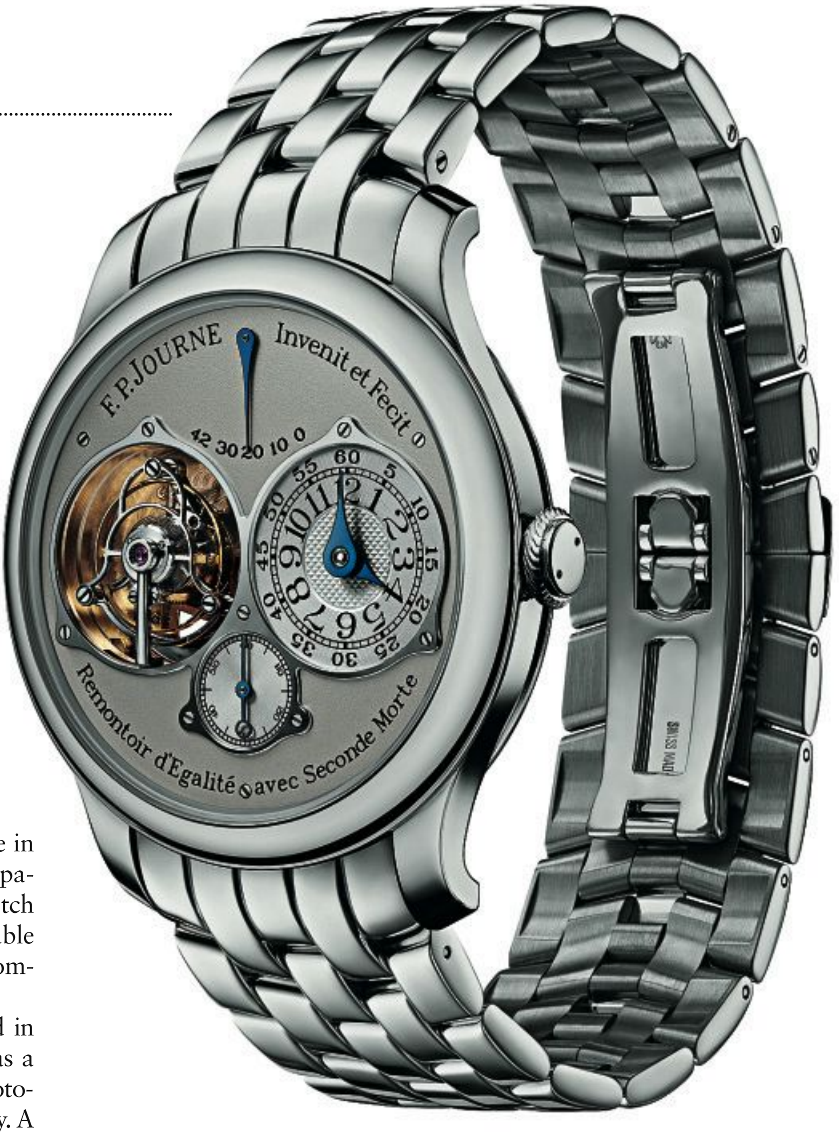
His first creation was a tourbillon wristwatch that he exhibited in Basel in 1991. The response was not very enthusiastic. "The epoch of the tourbillon had not yet dawned," Journe says. The situation gradually changed for the better. Journe worked for various companies, but more and more people asked him to sell them the watches he wore on his own wrist. Nonetheless, he didn't want to establish a brand of his own nor did he have sufficient capital to begin serial manufacturing. "So I wore out plenty of shoe leather until I found 20 customers, each of whom was willing to order a watch and pay for it in advance. Then I designed a collection and invented a new mechanism. That took me two years. I showed these first watches at the trade fair in Basel in 1999." The new mechanism was a *remontoir d'égalité*, which ensures that the amount of force powering the escapement remains steady as the mainspring winds down. The watch that contained the *remontoir* was called the Tourbillon Souverain.

This time, Journe's work was well received. Ever since, Journe has inscribed on his watches the Latin words "Invenit et Fecit" ("invented and made"), a phrase that 18th-century watchmakers inscribed on their timepieces to indicate that they had been approved by France's Royal Academy of Sciences as original works.

The aperture in the dial of the Sonnerie Souveraine shows the hammer of the striking mechanism.



BORROWING A SLOGAN from the old masters is one thing; matching their watchmaking skill is another. One of Journe's greatest challenges, he recalls, was to create, for the British retailer Asprey, a Pendule Sympathique, based on the famous



Journe incorporated his remontoir d'égalité in the 1999 Tourbillon Souverain.

Sympathique clock-and-watch timepieces that Breguet made in the late 18th and early 19th centuries. Like Breguet's Sympathiques, the one that Journe made consists of a pocketwatch that each night is meant to be placed in a cradle atop a table clock, where it synchronizes itself with the clock. Journe completed his Pendule Sympathique in 1988.

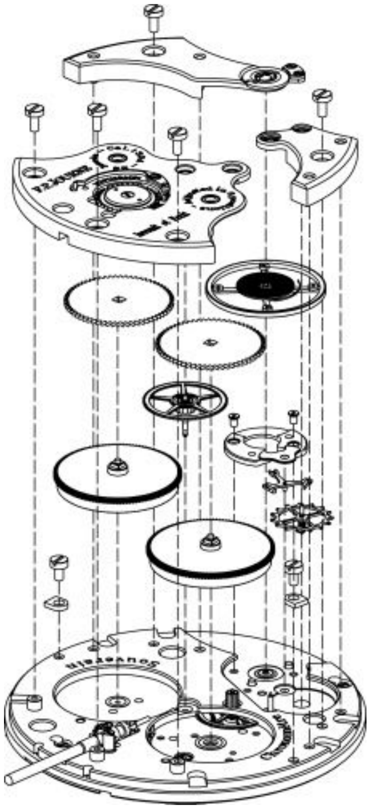
Journe is also proud of his Sonnerie Souveraine, unveiled in 2000, a wristwatch with *grande* and *petite sonnerie* as well as a minute repeater. "It took me six years to develop the first prototypes, followed by approximately seven months for the assembly. A patented mechanism ensures that the user cannot reset the time while the watch is striking. The mechanism blocks the crown so it cannot be withdrawn."

But Journe's favorite model is his Chronomètre Souveraine, which he introduced in 2005. "This is precisely the watch that I wanted to make at the beginning of my career," he says. "The movement has two barrels, which primarily assure greater stability of rate."

"IT'S EASY TO MAKE SOMETHING COMPLICATED, BUT MUCH LESS EASY TO MAKE IT SIMPLE."

Much as he likes it, Journe doesn't wear his Chronométre Souverain most days. Instead, he wears whatever watch he is testing at the moment: usually his newest creation. "Today, for example, I'm wearing the new CTS Centigraphe Sport, the first wristwatch made entirely of aluminum," he says.

What Journe likes most about his work is problem-solving. The more nettlesome the question, the better. "I'm especially happy when I find a solution to an extremely difficult problem," he says. "For example, the objective with the Grande Sonnerie was to create a reliable timepiece that cannot be damaged by attempting to reset the time during the striking process. Ten patents were registered for this device. It was especially challenging to construct the movement from only 450 components. It's easy to make something complicated, but much less easy to make it simple."



Exploded view of Caliber 1304, contained in the Chronomètre Souverain

Journe says the hardest thing he's ever created is the company itself. “In our factory, we produce each watch completely, not only the movement, but also the case and the dial. Only a very few components aren't made on our premises.” Ninety-five percent of the components needed for a movement are fabricated in Journe's own workshop.

Located in Geneva's banking district, the company employs 65 specialists in the research and development, construction, micromechanics and finishing departments and in a watchmakers' workshop. The factory turns out between 850 and 900 watches each year. Journe offers only about 10 different models because each of them works with its own designated movement. “I don't believe in the sandwich principle, i.e., a single base movement that can be augmented with one complication here and another complication there. We begin with a result and ask ourselves: What do we need to do to achieve this?”

Journe is always personally involved in the quest for solutions. He has nothing but watches on his mind, and his head is constantly full of new plans. Asked about his spare-time interests, Journe's answer is terse and to the point: “I have no hobbies.” Instead, he devotes himself wholeheartedly to his career, which is also his calling. “What's most important for me is to develop the watch that gives me the most pleasure. Without making any compromises. I simply do what I genuinely like to do, without thinking about whether it will appeal to someone else.” ○

The chief purpose of the two barrels in the Chronomètre Souverain is to ensure a stable rate.

The Journe boutique in Paris

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Pros

+ Sturdy case
+ Good legibility, day and night
+ Small rate deviation

Cons

− The clasp is hard to open.
− It’s easy to confuse the date and time-zone displays when resetting one or the other.

Photo: OK-PHOTOGRAPHY
Background photo: FOTOLIA.COM/FOTOGRAFICHE.EU

Tough Time

BY ALEXANDER KRUPP

This two-time-zone watch from Mühle-Glashütte is rugged enough for any off-road journey. How did it stand up to WT's rough-and-tumble test?

The Mühle-Glashütte Marinus GMT is a rugged travel companion that will tell you the local time as well as the time back home. Marinus means "belonging to the sea," and Mühle-Glashütte is known for its ships' clocks, yacht chronometers and marine time systems as well as its nautical wristwatches. But for the GMT version of the Marinus, Mühle has replaced the dive-time ring found on its basic Marinus model with a 24-hour bezel.

In order to clearly separate the second-time-zone display and the home-time display, Mühle added a red scale around the dial and a slender black GMT hand with a red tip. You can move the 24-hour hand forward in one-hour increments by turning the crown, setting it to the time in a second time zone. Or you can show the time in the second zone simply by turning the bi-directional rotating bezel to the desired position relative to the red-tipped hand.

Although the Marinus GMT isn't primarily a divers' watch, it is water resistant to 300 meters, making it ideal for use in and around the water. Its 44-mm, solid stainless-steel case with screw back and 2.5-mm-thick domed sapphire crystal protects it from shocks, temperature changes and water. Crown protectors guard the threaded winding crown against sideways blows. The only criticism of the case we have is that the rotating bezel does not click into place as neatly as we would wish.

Adventurers will like both the rubber strap and the optional stainless-steel bracelet. Both end in a folding clasp with hefty sides from which you can fold out a 2-cm-long extension piece. If you're exploring a canyon and decide to put on your wetsuit, you can quickly adjust your watch strap or bracelet to fit around your wetsuit sleeve.

SCORES

MÜHLE-GLASHÜTTE MARINUS GMT

Strap and clasp (max. 10 points):	**7**
Operation (5):	**4**
Case (10):	**8**
Design (15):	**12**
Legibility (5):	**4**
Wearing comfort (10):	**8**
Movement (20):	**12**
Rate results (10):	**9**
Overall value (15):	**12**
TOTAL:	**76 POINTS**

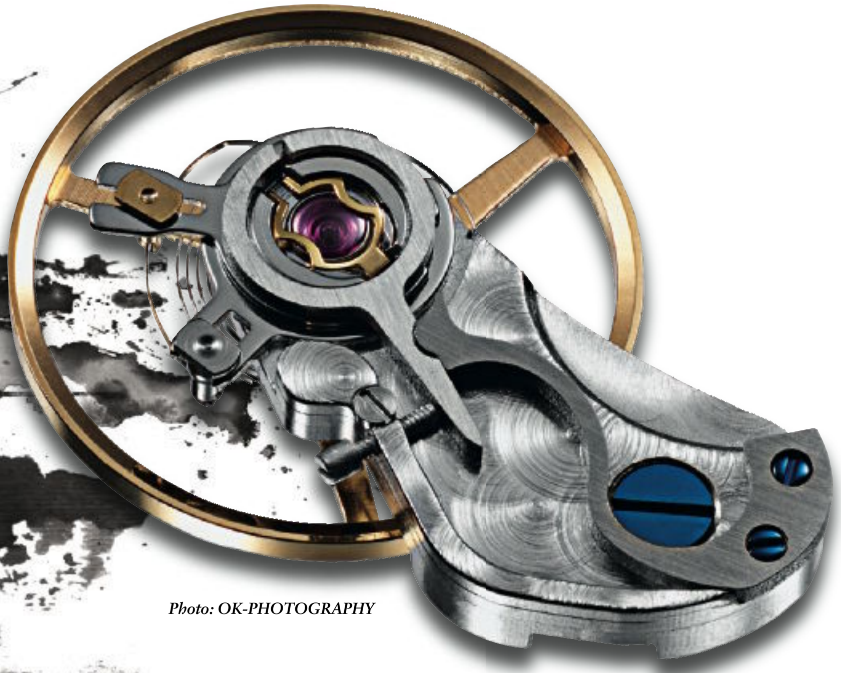

Photo: OK-PHOTOGRAPHY

Mühle's woodpecker's neck fine adjustment mechanism allows for precise adjustment yet is shock resistant.

Mühle has given ETA's automatic caliber 2893-2 additional components: a new rotor and its patented woodpecker's neck fine adjustment mechanism (see detailed photo). As in an ordinary swan's neck fine adjustment mechanism, the woodpecker variation can be precisely adjusted thanks to a setting screw and a curved opposing spring. The advantage over a swan's neck is that the regulator's pointer cannot slip over the spring or vice versa. Even if the watch receives a sharp blow, both of these components remain in their preset positions because the opposing spring has a raised edge that fits into a milled depression on the upper side of the pointer.

The modifications that Mühle made to the ETA movement are substantial, but its embellishments are rather plain, except for the blued screws. However, the movement is quite precise. Our electronic timing machine calculated an average daily deviation of +4.2 seconds and a maximum difference of only 3 seconds among the various positions. The watch gained no more than 3 seconds when worn.

Reliable rate behavior is only one of this watch's many good points. Thanks to moveable but firmly screwed lugs, the Marinus GMT fits comfortably around the wrist. Its large, luminous hands are very legible, but their shiny surfaces can cause glaring reflections in certain lighting conditions. The large threaded crown is easy to grasp. The only weakness we found here is the possibility of human error: when the crown is pulled out to its first setting position, the 24-hour hand can be advanced by turning the crown in one direction, and the date display can be adjusted by turning it the other way. There's a good chance that the wearer will confuse the two functions and misadjust the time zone or the date or perhaps both.

Looking at all of its details, the Marinus GMT has good-quality craftsmanship, and is as easy to operate as it is to read and to wear. Only the stubborn clasp detracts a bit: the closure lacks safety buttons and it won't open unless the wearer uses a lot of force. But that won't be a problem for the macho men likely to wear this watch. ○

SPECS

MÜHLE-GLASHÜTTE MARINUS GMT

Manufacturer: Mühle-Glashütte GmbH, Müglitztalstrasse 7, D-01768 Glashütte, Germany

Reference number: M1-28-53-KB

Functions: Hours, minutes, second time zone via 24-hour hand, date display, stop-seconds mechanism

Movement: Automatic ETA 2893-2 "Elaboré"; 28,800 vph, 21 jewels, Incabloc shock absorption, Mühle's own rotor and woodpecker's neck fine adjustment mechanism, 42-hour power reserve; diameter = 25.6 mm, height = 4.1 mm

Case: Stainless steel; bi-directional rotating bezel with calibrated scale made of black anodized aluminum; sapphire crystal is domed on top and nonreflecting inside; fully threaded back with transparent pane of sapphire; water resistant to 300 meters

Strap and clasp: Rubber strap; simple folding clasp with safety stirrup and easy-to-use extension mechanism

Rate results:

(Deviations in seconds per 24 hours)

Dial up	+5
Dial down	+6
Crown up	+3
Crown down	+3
Crown left	+5
Crown right	+3
Greatest deviation of rate	3
Average deviation:	+4.2
Average amplitude:	
Flat positions	281°
Hanging positions	245°

Dimensions: Diameter = 44 mm, height = 12.2 mm, weight = 139 g

Variations: With extendable stainless-steel bracelet ($3,099)

Price: $2,899

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First Base Man

Luc Perramond, CEO of La Montre Hermès, talks about the firm's first proprietary caliber, an automatic base caliber, and his moves to integrate the company vertically.

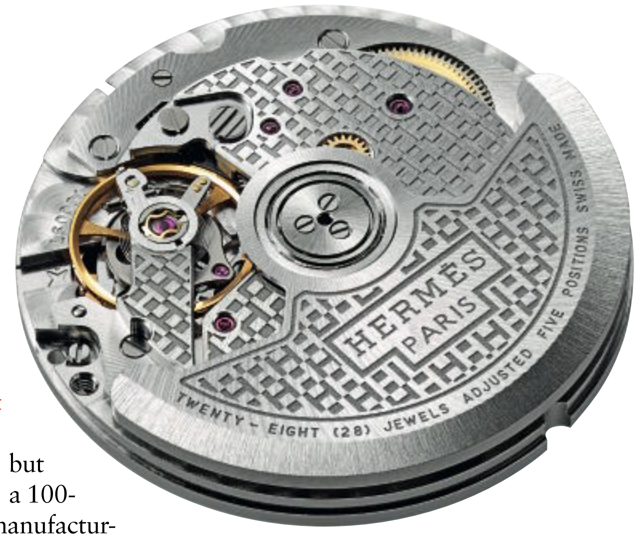
At this year's Baselworld, La Montre Hermès, the Swiss-based watch subsidiary of the famous Parisian leather goods firm, passed a milestone. It introduced two new watches bearing the firm's first-ever proprietary movements, one for men's watches and one for women's, both with the same automatic base caliber. The movements were designed by Hermès and manufactured by Vaucher Manufacture Fleurier, the Swiss movement producer in which Hermès has a 25-percent share. Hermès refers to the movements as "*manufacture*" calibers. The *manufacture* in question is Vaucher, not Hermès. Hermès does not produce the movements in house. (While Hermès has a financial interest in Vaucher, Vaucher Manufacture is part of the MHF Group owned by the Sandoz Foundation. Hermès is not part of the MHF Group.)

La Montre Hermès president Luc Perramond has overseen the project to create Hermès's proprietary base caliber since he joined the firm in 2009. Perramond is a watch industry veteran. Paris born and educated, he earned an MBA at the University of Pennsylvania's Wharton School and joined the Booz Allen & Hamilton consultancy in Paris in 1987. He was one of a trio of consultants, with Christian Viros and Philippe Champion, who advised the French firm Techniques d'Avant Garde (TAG) on the acquisition of Heuer Watch Co. After the takeover, TAG hired the three to run the new TAG Heuer firm. Perramond was the president of TAG Heuer USA until 1992, then moved to TAG headquarters in Switzerland, where he remained until 1999. From 2002 to 2008, he was with H. Stern Jewelers, running the European and Asian operations.

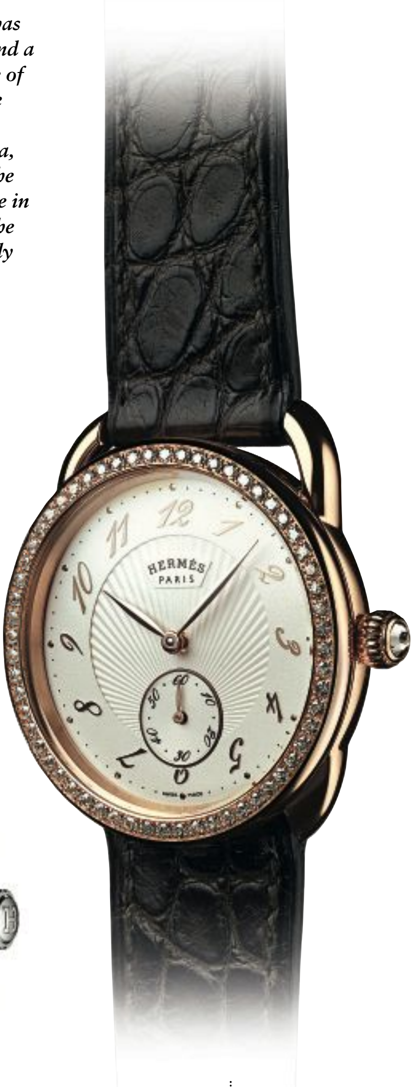
Recently *WatchTime* contributor Thomas Wanka, editor-in-chief of *Uhren* magazine, *WatchTime*'s sister publication in Germany, interviewed Perramond.

WT: Throughout its history, Hermès has never really distinguished itself as a watch manufacturer. How do you plan to suddenly acquire a reputation as an important watch producer?

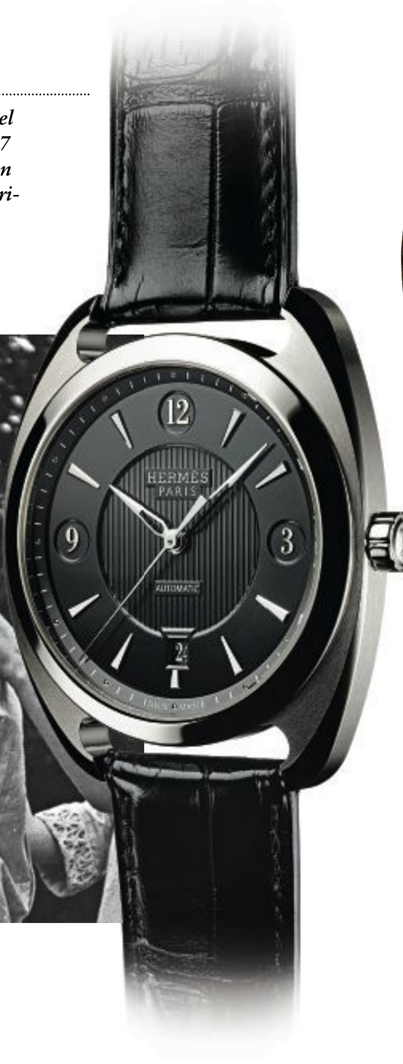
LP: It's not well known, but it's a fact that Hermès has a 100-year history as a watch manufacturer. It all began with the family's passion for watches. Jacqueline Hermès, a great-granddaughter of the firm's founder, wore a pocketwatch on her wrist in 1912. Needless to say, the strap for her timepiece was made in the company's own ateliers. Incidentally, her watch is on display in our museum in Paris. Hermès's partnerships with numerous watch firms began at that time. They included renowned manufacturers such as IWC, Cyma, Minerva,


HERMÈS PARIS
TWENTY - EIGHT (28) JEWELS ADJUSTED FIVE POSITIONS SWISS MADE

The H 1837 has two barrels and a power reserve of 50 hours. The hairspring is from Atokalpa, owned, like the majority stake in Vaucher, by the Sandoz Family Foundation.



This Dressage model contains the H 1837 movement, based on Hermès's new proprietary caliber.



An Arceau model containing the H 1912 movement, also based on the new caliber

Jaqueline Hermès wore a pocketwatch strapped to her wrist in 1912.

The Hermès watch factory in Brugg

The building's interior

Universal Genève, Baume & Mercier and many others. In all of these collaborations, both logos were put on the dials and we sold the timepieces through our distribution network. We also offered the first interchangeable straps. Our history includes the Ermeto watch, which was wound by sliding its protective cover open and closed.

WT: When did Hermès first produce its own watches?
LP: Jean-Louis Dumas established La Montre Hermès (LMH) in Bienne in 1978. That was the beginning of a process that gradually grew into our global collection. It was the first time in our history that we established workshops outside of France. All our other artisans – for example, those who make silk wares or leather goods – are based in France. Establishing a company where the specialized artisans live was a rather daring move at the time.

The big step came in 2006, when we acquired a 25-percent share in Vaucher Manufacture. That was a real milestone. We always had a strong reputation for design, but we said to ourselves that we wanted to be perceived as an independent watch manufacturer. That's why we decided to get involved with a movement manufacturer. It took six years, but we finally succeeded in conceiving and manufacturing [with Vaucher] our own exclusive movement – or rather two movements, strictly speaking. We use the same caliber as the base for two movements: one for men, the other for women. The larger one is 11½ lignes (i.e., about 26 mm) in diameter, the smaller is 10½ lignes (around 23 mm). It's particularly important for us to make mechanical movements that appeal to both women and men. Women are our most faithful customers, so we definitely wanted to offer them a mechanical watch. This is an especially important year for us; we celebrate our brand's 175th anniversary in 2012. In an allusion to the year of our founding, we named our gents' caliber "H 1837." Our ladies' caliber is named "H 1912" to pay homage to Jacqueline Hermès and the year that she first wore a wristwatch. So we now have an exclusive movement of our own in both our ladies' and our gents' collections.

WT: The other 75 percent of Vaucher belongs to Parmigiani and to the Sandoz Foundation. Is your share large enough to do justice to your claim of being a *manufacture*? Isn't Hermès still primarily perceived as a fashion brand?
LP: We certainly don't think of ourselves as a fashion brand. We're a genuine *manufacture* in everything we do, whether it's leather, silk or clothing. That's an integral part of our brand's philosophy. In this sense, we've never seen ourselves as a fashion brand, also not in the watch division. Watches have always been a part of

Vaucher Manufacture Fleurier in Fleurier

> *"THE BIG STEP CAME IN 2006, WHEN WE ACQUIRED A 25-PERCENT SHARE IN VAUCHER MANUFACTURE."*
>
> *LUC PERRAMOND*

our collection and an expression of our philosophy. That's why we've hired experts – because we've always endeavored to master each handicraft. And it's also why we integrate increasingly more know-how into our brand. Our philosophy insists that we do everything ourselves. The more one does on one's own, the better one can control what one does. It begins with the design and the technical development, and continues with the manufacturing of strategic components. We took a first step by producing our own calibers. We took over Joseph Erard, which has historically been our case maker, and we recently announced that we're in negotiations for the takeover of the dial-maker Natéber. This will also assure a supply of movements, cases and dials in the future. As you know, the watch industry is becoming increasingly more concentrated, so we're striving to ensure that our growth will remain strong in the future, too.

WT: But 25 percent ownership of a movement producer isn't a very large share to guarantee that independence. Would you like to increase your share in the future? Or are you searching for a second source?

LP: We're very satisfied with our share in Vaucher because we and the Sandoz Foundation are the only shareholders. This is an instance in which two families work together in perfect harmony to achieve their mutual goal. It's a very good situation and a very good partnership. Of course, it doesn't mean that we never work with other specialists, e.g., Dubois Dépraz or others, when collaboration is needed to create special complications or other functions such as a moon-phase display or the like. But Vaucher remains our principal partner.

WT: And it will suffice as an industrial basis for the long term?

LP: Vaucher made major investments in a new factory building in 2009. That resulted in a capacity of 20,000 movements per year, and the capacity can be increased whenever desired. [Vaucher] will probably produce about 5,000 movements [for Hermès] this year, so we have plenty of room to grow in coming years.

WT: But don't you have to share Vaucher's capacity with Parmigiani?

LP: Yes, but Parmigiani makes watches in a much more exclusive price segment and therefore doesn't need such large numbers of units.

WT: The "Arceau Le temps suspendu" is a highlight in your collection. This special complication lets the user stop the time display while the movement continues to measure the passing time in the background, so to speak. The display returns to synchrony with the current time at the push of a button. Is this module based on an ETA caliber?

LP: Yes, because our own automatic movement wasn't yet available when the Arceau Le temps suspendu was first presented. Jean-Marc Wiederrecht, the design engineer who created the Arceau Le temps suspendu, is now conducting analyses to determine which modifications will be needed to adapt his fascinating complication so that it can be built into our caliber, which will also continue to serve us well in the future. We're developing many modules with surprising functions that harmonize especially well with the Hermès philosophy and with our playful approach to time. We developed the caliber so that it would be able to power all of these modules. All new modules will be based on our own automatic movement. Anything that's conceivable, e.g., an annual calendar or a chronograph, is also technically possible. The limits are set only by our imagination. ○

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Controlled Chaos

BY MARTINA RICHTER

For a couple of seconds every hour, the dial looks like a mess, but then all is made clear. Meet the Harry Winston Opus XI.

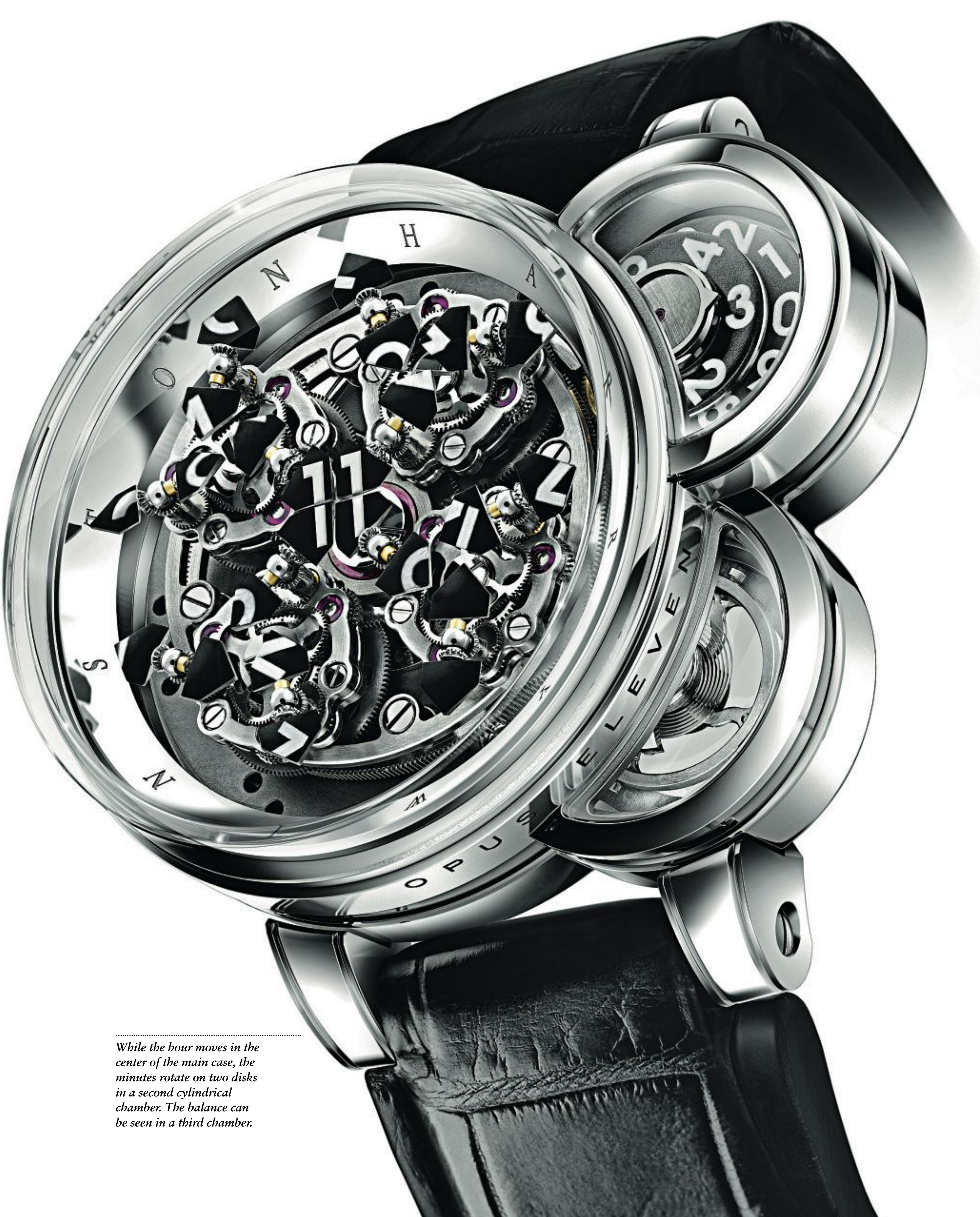
The circles, spins and flips of carnival rides were what inspired Denis Giguet in his design of the Opus XI, unveiled last year as part of Harry Winston's Opus series featuring offbeat watches conceived by various independent watchmakers. Every hour, on the hour, in the span of 2 or 3 seconds, the hour display – a system comprised of a multitude of wheels, pinions, arbors, bearings and tiles – disintegrates into utter chaos and then returns to order for the remainder of the hour.

This chaos originates from a "completely normal" watch movement with manual winding, a 48-hour power reserve, and a frequency of 21,600 vph. The movement has a very large balance, which is visible in a cylindrical compartment sticking out from the side of the case. The movement was designed in the tradition of old pocketwatch movements, and can be seen through the transparent sapphire caseback.

The rest of the watch is anything but normal. The movement's gear train ends in the minutes indication, which is itself quite unusual. It consists of two rotating disks in a small, cylindrical chamber similar to the one holding the balance. The larger outer disk runs smoothly and continuously to show the single digits, while the smaller, inner disk printed with numerals for the tens advances with a jumping action.

But even more unusual is the hour display, which is the watch's centerpiece both literally and figuratively. It would not have been possible to make this display without recently developed design and manufacturing methods.

The display is powered by its own barrel. As the movement's other barrel slowly unwinds, it supplies energy to this second



While the hour moves in the center of the main case, the minutes rotate on two disks in a second cylindrical chamber. The balance can be seen in a third chamber.

barrel. Every hour, the display explodes into motion as the numeral for the "old" hour disintegrates and the new hour numeral takes shape in the center of the dial. Every numeral is composed of four tiny tiles, each bearing a segment of the numeral. There are 24 tiles in all. The tiles are disassembled and reassembled by means of epicycloidal gear trains.

An epicycloid describes the path taken by a point (like one of the tiles in the hour display, for example) on the circumference of a circle as that circle rolls around the circumference of a second, fixed circle. The rolling point traces curves whose shape depends on the radii of the two circles. The hour display of the Opus XI follows this principle and originates from several epicycloids.

The changing of the hour is triggered by the minutes display. At the end of every hour, a spring falls onto a cam to release the hour-display barrel which has, in the meantime, stored enough power to set the hour display in motion in a series of wild rotations. They last for 2 to 3 seconds, after which the barrel will have spent all its energy. The main movement barrel will immediately start feeding fresh power to the hour-display barrel so that it will be ready for the next hour change. During the intervening 60 minutes, the entire system in the main case body remains motionless and the current hour stays clearly visible in the center of the watch.

But what exactly happens when the spring falls onto the cam again and the second barrel is released to change the hour?

A toothed wheel that is almost as large as the entire main case of the Opus XI is in contact with the hour-display barrel. There are four smaller satellite wheels inside the large wheel. Once the wheel is set in motion by the barrel, it drives the four smaller inner wheels along its inner teeth. Geared platforms are mounted on their vertical arbors, along which three satellite wheels engage according to the same principle. Four times three equals 12 (hours). Conical wheels sit on the arbors of these last satellite wheels, which are needed to change direction from the vertical to the horizontal rotational axes of the arbors with the hour display tiles. Two tiles are attached to each arbor, and 12 times two equals 24 tiles. Each tile is printed twice, front and back, so 48 surfaces fit together, four at a time, to display the 12 hours.

To visualize how the tiles move, think about being in the car of a carnival ride, flipping over while the car rotates around a common midpoint along with two other cars, and circling around the main rotational axis of the ride as an independent satellite. Got it? After no more than three rounds it's easy to lose your orientation. Fortunately, the individual tiles in the Opus XI always know exactly where to go next.

Finally, triangular gears are designed to manage the complicated turning maneuvers, along which elliptical wheels interact with the bevel gear satellites. The pairs of tiles attached to each satellite form the 12 hours. This means that after half a day the entire mechanism returns to its original po-

SPECS

HARRY WINSTON OPUS XI

Manufacturer: Harry Winston SA, 8, Ch. du Tourbillon, CH 1228, Plan-les-Ouates, Switzerland

Reference number: 500/MMDGWL

Functions: Hours on 24 tiles, digital minutes on two rotating disks

Movement: Hand-wound Opus XI, produced since 2011, 21,600 vph (3 Hz), 566 components, 155 jewels, 48-hour power reserve

Case: White gold, three overlapping cylinders, sapphire crystals, water resistant to 30 meters

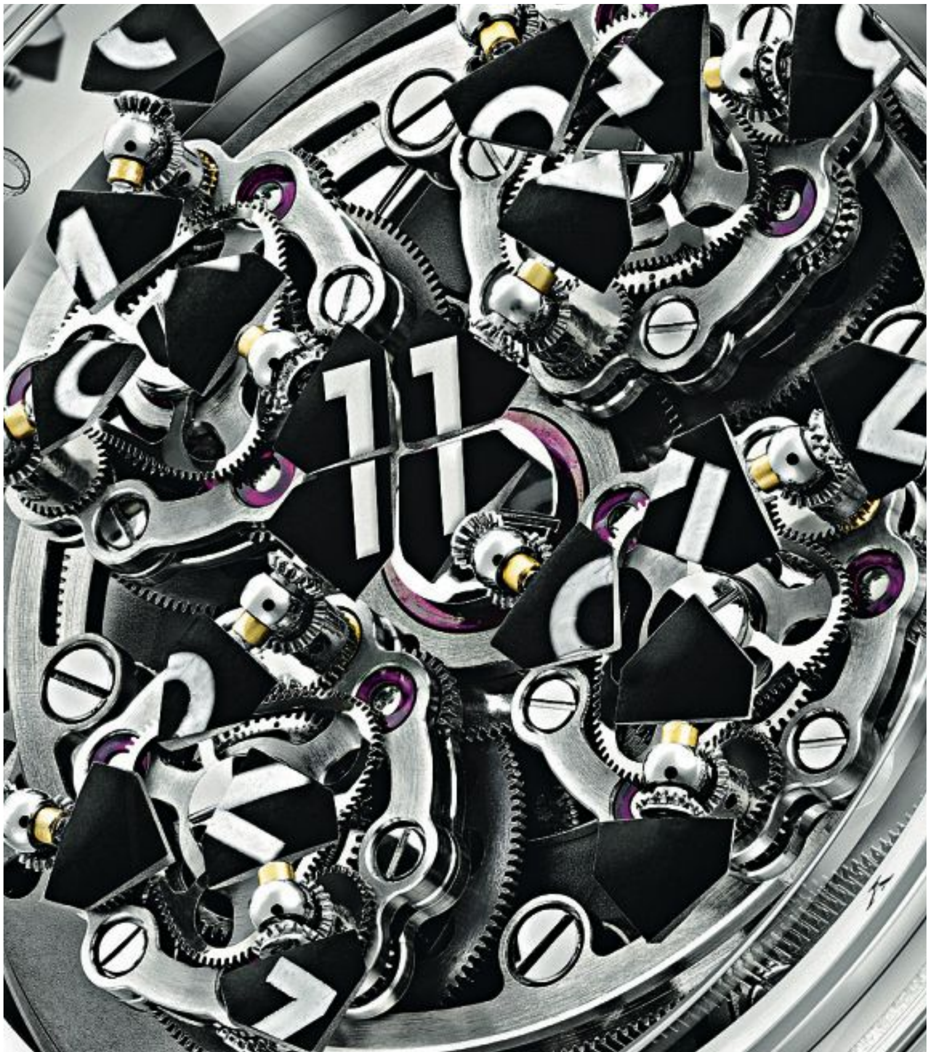
Strap: Alligator strap

Dimensions: Diameter = 45 mm

Variation: With diamonds

Price: $254,700

Four tiles come together to display the hour numeral. The bottom of the photo shows how the tiles are moved to the center of the dial by means of a large wheel, satellites, and triangular, elliptical and bevel wheels.



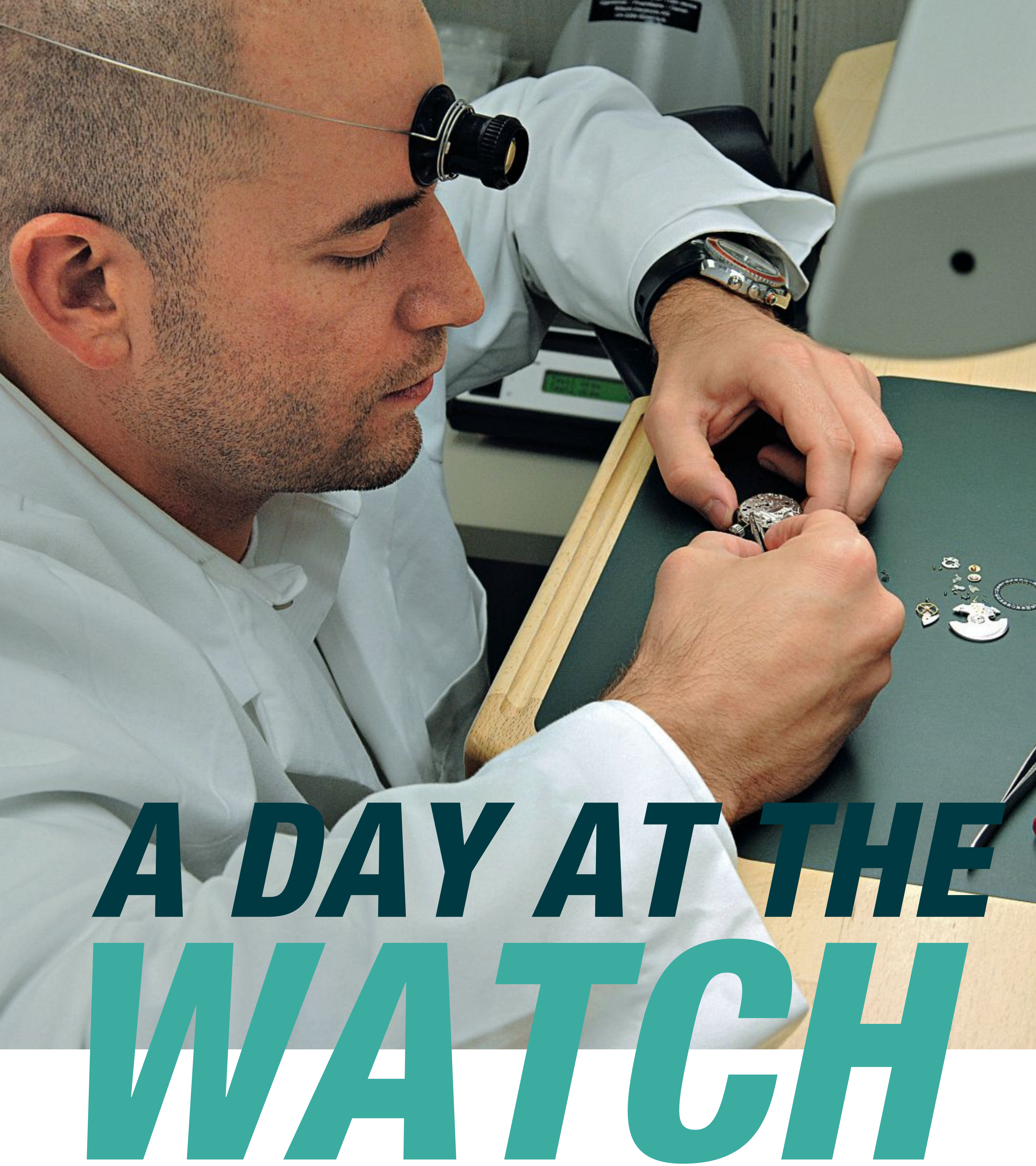
Denis Giguet, the brains behind Opus XI

sition. After six hours the same tiles will be in the center of the dial and form an hour number. However, the tiles will be turned 180 degrees. In the same way, the entire system is shifted by 180 degrees. For example: the top left tile of the "11" (see photo) will become the lower right tile of the "5" after six hours – that is, its flip side, which after another six hours will again be the top left tile of the "11." Within this period the satellite will have moved four times around the triangular gear and its arbor will have turned 30 times along with the tile.

The large wheel, which is driven by the barrel, continues to advance 90 degrees during an hour transition, in order to return to the same place after four hours. Its four satellite wheels will also be in the same position after four hours, but not its three additional satellites with their tiles. They will move 120 degrees during each transition, making one revolution around the triangular gear after a three-hour period. However, they do not return to the same configuration they were in three hours earlier. The tiles are now in a different location in relation to one another. In pairs, they alternately complete two or three half turns every time they change position. The triangular gear and the elliptical gears are designed so that they can vary these transmission ratios. This allows the tiles to pass by one another without colliding and to reappear in the center at the proper time. After three hours, the same satellite will again be in the center but show the reverse side of the tile. Depending on the tile, it will have turned seven or eight times, 15 times in six hours, or 60 times a day.

The incredible calculation and design work behind the hour-changing mechanism of the Opus XI was only made possible with computer programs that weren't even designed a few years ago. Today these programs can calculate, analyze, draw and optimize the tooth shape of the triangular and elliptical wheels and how they mesh. The wheels themselves were created through the use of photolithography – a process where tiny components can be manufactured with a precision that cannot be achieved with conventional manufacturing methods. The conical pinions for the bevel gears, for example, are just 1.2 mm wide. Their shape, angles and teeth are perfectly accurate thanks to this new manufacturing technology. The shape and path of each tile was also calculated using computer technology in order to minimize the space required for the switching action. The case and sapphire crystal, which themselves are the result of complicated production processes, offer a broad view of the astonishing hourly movements. You may enjoy the exhilaration of a wild carnival ride – with the Opus XI it occurs once every hour.

As you might guess, Denis Giguet is no newcomer to avant-garde horology. Trained as an engineer, he served as head of production for Harry Winston. In 2007 he launched his own brand, Manufacture Contemporaine du Temps (MCT), and designed its flagship watch, the Sequential One – in which the hour numerals are each composed of five prism-like segments, arranged like slats in a Venetian blind, which flip over to form a new numeral at the appropriate time. Twenty technical specialists worked with Giguet to develop the Sequential One. They included Eric Giroud and Jean-François Mojon, who collaborated with Harry Winston on, respectively, Opus IX and X. ○



A DAY AT THE WATCH

SPA

WatchTime goes behind the scenes to see what happens when a watch is serviced.

BY MIKE DISHER

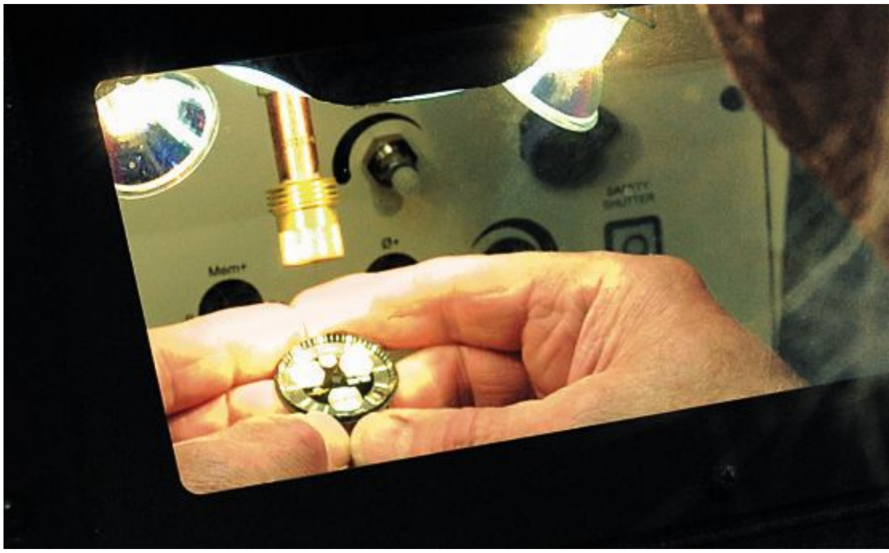
PHOTOS BY JOHN JOHNSTON

Have you ever wondered exactly what happens to your watch when you send it in for an overhaul? To find out, I visited Stoll & Co. in Dayton, Ohio, an independent watch repair company, to take a look behind the scenes. Stoll & Co. repairs all types of watches, from inexpensive quartz models to the most complicated luxury timepieces, and from vintage fusée pocketwatches to wristwatches featuring the latest escapement designs. Founded 30 years ago, Stoll & Co. performs wholesale repairs for many leading watch and jewelry retailers, and they also accept repairs directly from watch owners. In short, they see it all.

I wasn't sure what to expect when I first got there. Ask most people to envision an independent watch repair company in a midsize Midwestern town, and they probably conjure up a small workshop with a couple of watchmakers working on perhaps a dozen watches per week. As I learned, Stoll & Co. operates on a larger scale – much larger. The size and complexity of the operations were the first things I noticed. The 6,000-square-foot facility is divided into 11 main areas. Each week, more than 3,000 watches arrive for service. Stoll & Co. employs 44 people to handle them all, and a watch may pass through the hands of as many as 15 people, including four different technicians and watchmakers, before a service is complete. A high-grade-mechanical-watch overhaul includes an initial inspection; disassembly; case and bracelet disassembly and refinishing; movement disassembly, cleaning, reassembly and lubrication; regulation; pressure testing; a second round of extended timing checks; and final quality control.

Most watches arrive at the facility via UPS or FedEx. When a truck backs up to unload, hundreds of boxes are stacked high in the receiving area and it's a beehive of activity. Everything is quickly unpacked and double-checked to make sure the number of watches delivered matches up with the individual packing slips.

Polishing a watch case



A technician uses the LaserStar welder to repair a watch dial.

Next, repairs are sorted by type: warranty and non-warranty repairs, rush jobs, jobs requiring estimates, etc. Watches sent in by owners, called personal repairs, usually arrive with notes explaining the problems. These repairs are also sorted. Each type of repair follows a different path through the facility.

After the initial sorting, each watch and its paperwork are placed in a sturdy, clear plastic zip-top bag. Each job receives a bar code and a tracking number based on the type of repair. When I visited, Stoll & Co. was preparing to install a smart-tag system that will allow the company to instantly locate any watch within the facility.

Most watches are photographed after being unpacked to document their condition. Each watch is then entered into a tracking system powered by custom software. The software tracks every aspect of each repair, generating an audit trail listing each action taken, the date and time, and the person who took the action. Company owner Ron Stoll is so focused on efficiency that when he was working with the software designer, one of the goals was minimizing the number of keystrokes required for each type of entry. He also does time/motion studies when deciding whether to purchase new equipment. Speaking of equipment, Stoll likes to use the best from top Swiss and German manufacturers. When representatives from major manufacturers visit his facilities, he wants them to see the same machines they see in their own factories.

Watches requiring estimates go to John Gaeke, a watchmaker who has been with the company since 1984. Gaeke is a collector who owns about 50 watches, and he knows a great deal about watches from all eras. It's hard to imagine many people in the country seeing more watches than he does. About 40 percent of the watches that come in, or roughly 1,200 per week, cross Gaeke's desk. He examines each one and makes a diagnosis, noting whether parts are required. Most parts are in stock; if they are not, they are ordered.

In another department, the estimate is keyed in and a customer relations specialist sends the estimate to the retailer or owner. Stoll & Co. strives to have estimates back in 72 hours. Customers must approve estimates before work begins. All jobs awaiting approval are kept in a walk-in vault. A tickler system reminds the staff to follow up if no approval is received within two weeks.

There are different types of warranty repairs. Some are original manufacturer warranties where Stoll & Co. is an authorized service center. Others include warranties sold by retailers that either extend the original factory warranties, or that serve as original warranties on pieces that would not otherwise be covered.

Once the needed approvals and parts have been received, jobs are assigned to watchmakers and the repair process gets under way.

UNCASING THE MOVEMENT is the first step in an overhaul. The watchmaker assigned to the watch handles this step, after which the case and bracelet are sent to the refinishing technicians. The case and bracelet are broken down into their component parts: case back, center section or case band, bezel, crystal, bracelet and end pieces, buckle/clasp (if designed to be sep-

A watchmaker places a basket containing parts in the ultrasonic cleaning machine.

The sparkling-clean movement is reassembled.

arated from the bracelet), etc. Broken bracelets and clasps are repaired before being refinished. Crystals with anti-reflective coating must be kept away from refinishing equipment and ultrasonic cleaners to protect the coating from scuffs and scratches.

Refinishing technicians evaluate the finishes and plan their approach. If they're working on, for example, a Rolex Oyster-style bracelet, they use for the polished areas a muslin buff treated with dry rouge mounted on a high-speed bench-top motor. The technician holds the bracelet in his hands and guides it on the buff. Other surfaces, such as the sides of the case, are polished with hand tools. Whenever possible, cases are finished to factory specs. Edges and corners remain sharp, if that is how they came from the factory. Experience and skill are required to get the finish just right. Unfortunately, prior poorly executed refinishing usually can't be remedied. Sharp edges and corners that have been polished away cannot be brought back to factory spec.

Next, the muslin buff is replaced with a satin wheel. A special heat-resistant tape is used to mask off the polished areas, and the satin finish is applied. Again, some areas, such as the tops of the lugs, can't be finished properly with the wheel, so they are done by hand using emery sticks. Everything is done to factory specs, which spell out details such as the angle of the satin on the tops of the lugs. Where a circular satin finish is required, such as the underside of the bezel, the part is placed in a lathe, where the spinning action yields the proper finish.

Bead-blasted finishes present special challenges, as no two brands use exactly the same finish. Matching factory finishes requires using different blasting media recipes. (Blasting media usually consists of very fine beads made from glass or aluminum oxide.) Bead blasting equipment is similar to the spray guns used to paint cars. An adjustable nozzle with a trigger is attached to an air compressor and a container of blasting media. Depressing the trigger releases an air-powered jet of media. The part(s) being refinished are suspended in a box that captures the media. As with polishing and satin finishing, areas that must be protected are masked off with impact-resistant tape.

The final refinishing steps include placing the parts in an ultrasonic cleaner for 15 to 20 minutes, followed by a steam clean and dry. Each part is then individually wrapped and sent back to the watchmaker who is servicing the movement.

THE HEART OF THE service center operation is the clean room where high-grade mechanical movements are serviced. Here, positive air pressure, air filters, sticky mats, lab coats, finger cots, and other steps help insure potential contaminants are kept in check. This room reminded me of a smaller version of the assembly workshops at the top factories in Switzerland. Stoll also owns Carl F. Bucherer North America, which distributes the CFB brand, and Bucherer watches are serviced in this room. Most of the Stoll & Co. watchmakers are WOSTEP graduates, while a few entered the profession as apprentices. The watchmakers also receive factory-sponsored training so they

An uncased movement is timed.

This machine does both pressure and vacuum tests without water.

are up to date on the latest movements and techniques. Technicians with training on all levels are available to handle almost any watch complication.

Each workstation has all of the tools and instruments each watchmaker needs – sharing would slow things down. Each watchmaker has a specialty, such as chronographs, calendar watches, vintage pocketwatches, etc. However, all watchmakers work on a variety of movements to keep their skills sharp and their jobs challenging.

After the movement is removed from the case, the dial, calendar display rings or disks (if any) and hands are taken off and set aside. The movement is placed in a holder, dial-side down, and if it is an automatic, the rotor, reversers and gears are removed. Next, the mainspring, barrel and barrel bridge are removed. The mainspring is inspected and replaced if it appears to be compromised.

Next, the movement components go into baskets to be placed in an ultrasonic cleaning machine, where the combination of a petroleum-based cleaning agent plus cavitation (bubbles induced by high-frequency sound waves) deep-clean everything. After the cleaning, the parts go through three ultrasonic rinse cycles, with each cycle leaving the parts cleaner than the last. The final step is a heated centrifugal dryer where a final rinse leaves the parts spot free. Each of these cycles takes about 20 minutes, and an especially dirty movement can go through the multi-cycle process a couple of times.

Once the components are clean, the movement is ready for reassembly and lube. To lubricate the movement, watchmakers use both hand and automatic oilers. Automatic oilers look like pens with small reservoirs for oil near the tip. Pressing a button dispenses oil to the tip, which looks like a very short piece of fine wire. Hand oilers look like small screwdrivers, and the tips of the wires have different shapes to hold different amounts of oil. The oil is kept in small cups with lids to prevent contamination and evaporation. The watchmaker dips the tip in the oil to pick up just the right amount for a given application.

Many parts of a movement require lubrication. On a Rolex caliber 3135, for instance, the areas that are oiled include the mainspring and barrel, the pivots or jewels for all gears, the face of one pallet stone (typically the entry pallet), the canon pinion, and several of the winding and setting components.

ONCE THE MOVEMENT is back together, it is fully wound and attached to a Witschi timing machine's microphone so that the machine can "listen" to the watch's beat rate. The movement is attached in the dial-down position and allowed to run for a minute or two to let it settle down (it only takes the machine about 10 seconds to determine the beat rate and amplitude). The timing is checked before the dial and hands are replaced to minimize handling those components. Ideally, the room where the timing machines operate should be quiet, as the sensitive microphones can pick up extraneous sounds, which can affect performance. A loud machine operating near a timer can generate a "snow" pattern on the timer's LCD screen, rendering the timer useless. The Stoll & Co. clean room is very quiet.

Most watchmakers regulate the watch with the movement still mounted on the microphone, so they can receive instant feedback as they make their adjustments. The microphone is on a motorized mount, allowing it to run movements through a series of positions automatically. Once the watch has been timed in all positions, the timing results are printed, and the print-outs are included with the watches when they are returned to the owners or retailers.

After the movement is regulated, the dial and hands are replaced and the movement is re-cased with all new gaskets. Gaskets must be replaced, as they can become dry and brittle. Even if they are relatively new, gaskets deform after installation, so new ones should always be installed at each service.

With the dial and hands installed and the movement in the case, but before the caseback is installed, the watch is placed on the microphone a second time to confirm that the timekeeping is still within specs. If not, the movement is regulated again. Once the timekeeping is verified, the caseback is installed and the case is pressure-tested. All timekeeping checks and pressure testing are performed by the watchmaker servicing the watch. Each watchmaker can service three or four simple watches or one or two chronographs per day.

Dials requiring refinishing are sent out to specialists. Stoll & Co. has a LaserStar welding system on site to make repairs such as reattaching dial feet.

Once a watch has been serviced and fully reassembled, it goes through final quality control. For mechanical watches, phase one is a timing and performance test. Automatics are mounted on a huge Astuto winder for five to seven business days. Manual-winding watches are hand wound once per day for the same period. Timekeeping and calendar functions are checked and the results are noted daily. Any watch that is not up to spec is sent back to the watchmaker.

After the timing check, final quality control includes checking hand alignment, crown functions, winding, and appearance (dust, lint, fingerprints, smudges, etc.). All pins and screws are checked for tightness, and all finishes are examined to make sure they meet factory specs. All old parts are returned to the customer. After everything checks out, the watch is packaged up and returned to the retailer or the owner.

High-grade-mechanical overhauls of the type described here usually take four to six weeks. Smaller jobs such as bracelet repairs can be completed in one to two weeks. The watch arrives home in as close to new condition as possible, and nothing makes an owner happier than receiving his or her timepiece in beautiful condition after it has been to the spa. ○

The Astuto winder, manufactured in Neuchâtel, can wind up to 90 watches.

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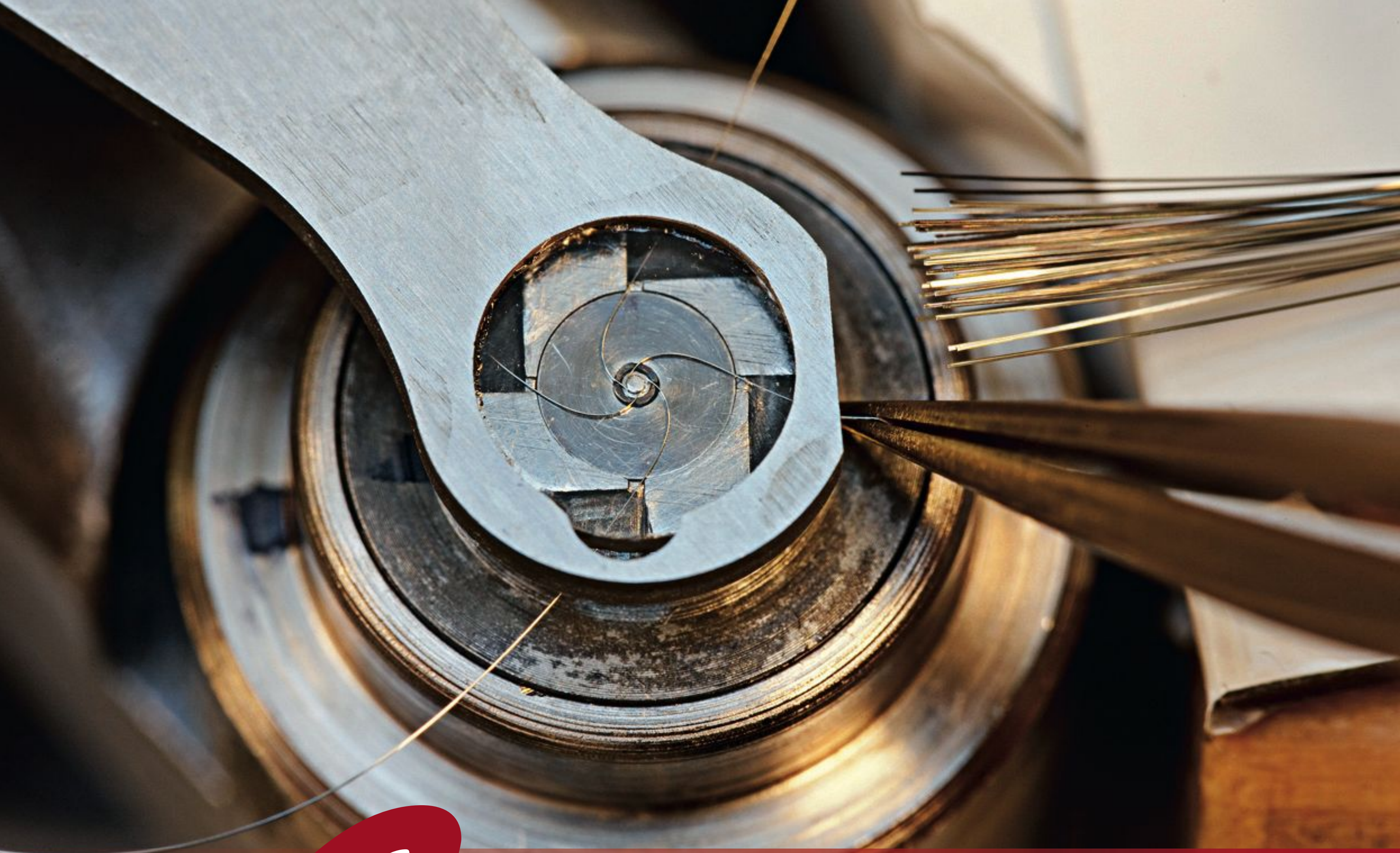
Heart throbs

The hairspring and the balance combine to form the heart of a watch. With the main maker of hairsprings, Nivarox, reducing deliveries, how will watch manufacturers cope?

BY GISBERT L. BRUNNER



Four metal strips are wound into hairsprings at A. Lange & Söhne.

A hairspring is minuscule, but its importance cannot be overestimated – a mechanical timepiece simply won't work without it. At just 3/100 of a millimeter thick, this tiny spring is thinner than a human hair. It weighs only about 2.5 milligrams. But if you remove it from a movement, the watch will grind to a halt instantly. Without the tiny spring, the balance (the hairspring's partner, to which it is attached) will stop oscillating after just one beat. The gear train will also stop dead in its tracks because it lacks the life-supporting energy the hairspring provides. It's no wonder that the hairspring is called the "soul" of a mechanical watch.

Ambitious watchmakers and engineers have devoted themselves to this tiny component for decades. Few secrets remain. Contemporary hairsprings are made from an alloy known as "Nivarox," a name coined from the French acronym for "neither variable nor oxidizing." Reinhard Straumann (1892–1967) perfected the process of hairspring manufacturing using Nivarox in his Waldenburg, Switzerland, laboratory in 1932, which greatly improved the accuracy of watches. Nivarox consists primarily of iron, nickel and chrome, with additional mixtures of very small amounts of beryllium and other ingredients.

Straumann's patent from the 1930s specifies the formula for the Nivarox alloy, but he never divulged all the details of his secret blend. The exact formula is known only by a select few individuals at Nivarox-FAR, a subsidiary of the Swatch Group.

These tiny springs function almost perfectly with monometallic balances made from Glucydur, a blend of beryllium bronze, brass and nickel. The theory on which the rate behavior of mechanical watches is based is complex enough to fill many volumes, but we'll make a long story short: each semi-oscillation of the balance and its hairspring should be as nearly identical to every other beat as possible, regardless of shocks, magnetic fields and fluctuations in air pressure and temperature. When this is achieved, the device is said to oscillate with perfect isochronism. Temperature fluctuations cause particularly drastic changes in the length and elasticity of the metal strip that forms the hairspring. In simple bronze hairsprings, an increase or decrease of just 1 degree Celsius can cause a watch's daily rate to deviate by as much as 10 seconds. But thanks to the negligible temperature coefficient of Nivarox, hairsprings made from this alloy can reduce the daily deviation of rate to just half a second.

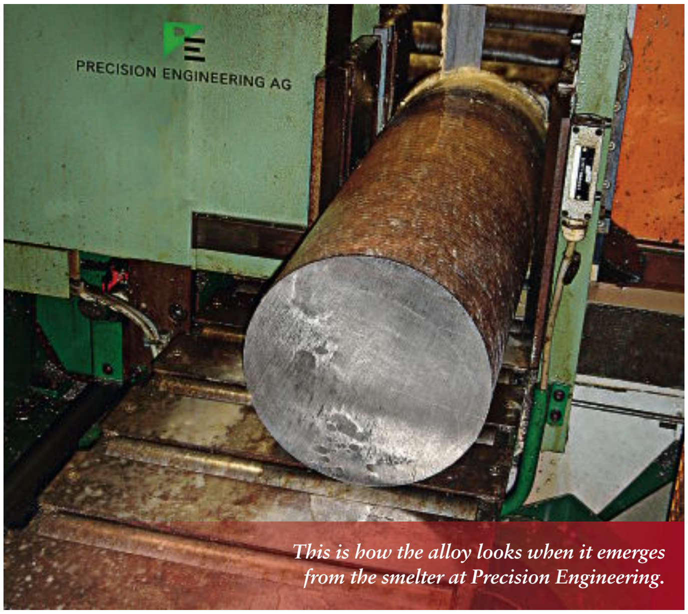
The production of hairsprings begins with a 0.5-mm-diameter Nivarox wire. This diameter is too large to be made into a hairspring, so the threadlike alloy is sequentially drawn through numerous drawing dies, each of which is pierced all the way through. When the drawing process is complete, the wire's diameter is reduced to 1/10 its original size. Hard metal rollers flatten the wire into a strip with a thickness – or rather, thinness – as small as 0.046 mm. This task must be performed with the greatest possible precision: deviation of more than 1/1,000 mm would render the metal strip useless.

When the process is finished, the metal strip that will be made into hairsprings must be uniformly thin and wide: 0.09 mm by 0.018 mm. Next, this long ribbon is cut into precisely measured lengths. These blanks are fastened in groups of three, four or five, into the center of a winding block. Several springs must be wound one atop the other to give the hairsprings the correct form. These springs then undergo a stabilizing heat treatment in a vacuum kiln. Then they're separated from each other and thoroughly cleaned. The result is a hairspring, but one not yet complete.

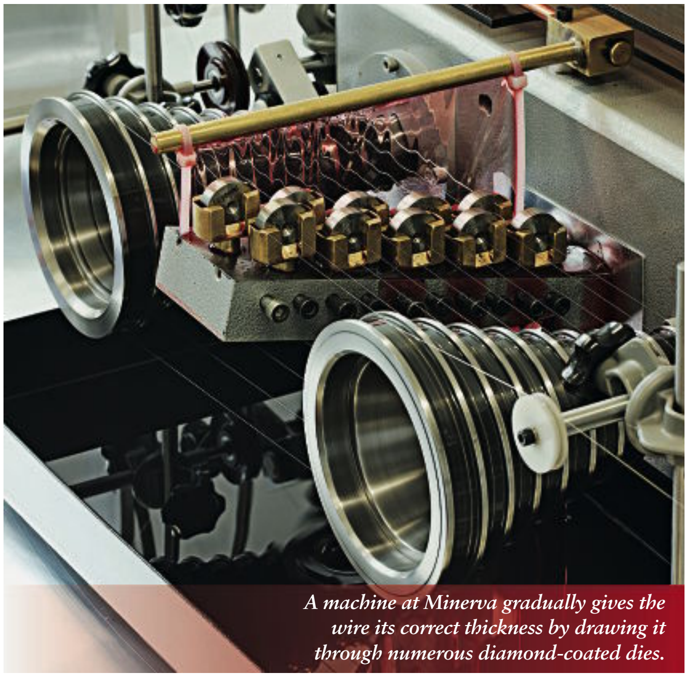
The final and all-important step is to bend one end of the spring into an exactly sized curve, which then must join with a matching balance wheel. This phase of the work is known as "classifying." There are usually 20 classes of hairsprings and 20 corresponding classes of balances. For example, to facilitate subsequent fine adjustment, a class 5 hairspring can only be coupled with a precisely poised balance of the same class. The next step is to connect the duo. The inner end of the hairspring is either pinned to a collet or, in a more modern procedure, welded to it using a laser. Afterwards, the ensemble must be painstakingly pre-adjusted. Deviation of 120 seconds per day is typical here; watchmakers will make subsequent fine adjustments.

Nivarox-FAR is the main manufacturer of hairsprings. The company was formed in 1984 when Nivarox SA (established in 1933) merged with Fabriques d'Assortiments Réunis (FAR). An estimated 90 to 95 percent of the Swiss watchmaking industry is more or less dependent upon Nivarox-FAR, which is headquartered in Le Locle, in the Jura watchmaking region of western Switzerland. If its machinery were suddenly to stop running, the entire production of mechanical watch movements would have to be interrupted soon afterwards. In other words, Nivarox-FAR remains a near monopoly – for the time being, at least. As a consequence of its extremely attractive prices, and its position similar to the one ETA, also owned by the Swatch Group, holds as a movement supplier, Nivarox-FAR is essentially without competitors.

A complete escapement group, or "assortment" (hairspring, balance, anchor and escape wheel) costs about 12 Swiss francs (approximately $13.20) in a minimum order of 1,000 assortments. But the price is also determined by the desired quality. Let's use the familiar ETA 7750 chronograph caliber as an example: the combination of a balance and its hairspring (an "*exécution chronomètre*") that are sufficiently well made to later earn COSC certification for its timepiece costs about twice as much as an ordinary pair (an "*exécution normalisée*").



This is how the alloy looks when it emerges from the smelter at Precision Engineering.



A machine at Minerva gradually gives the wire its correct thickness by drawing it through numerous diamond-coated dies.

One reason that Nivarox-FAR can deliver its wares at such low prices is its many years of manufacturing experience. Even more important are the company's vast knowledge of large-series industrialized manufacturing and its investment in a facility that has surely paid for itself many times over. No artisan or small-series manufacturer can compete with this unbeatable combination.

THE EQUIVALENT OF A MINOR earthquake shook the Swiss watchmaking industry in mid-2011 when the Swatch Group approached Switzerland's Competition Commission (Comco) and asked for an investigation to determine whether it could, without violating antitrust law, stop delivering certain mechanical-movement components to companies outside the Swatch Group. Comco agreed to investigate, and, pending its findings, which are expected to be announced in the second half of next year, ruled that the Swatch Group could reduce 2012 and 2013 deliveries of escapements by 5 percent below 2010 levels. The Swatch Group's request was packed with explosive power: the ensuing controversy far exceeded the hullabaloo that the Swatch Group triggered in 2002 when it announced the phasing out of ébauches deliveries by ETA, its movement-making subsidiary.

The complexity of the processes involved in the serial production of hairsprings is inversely proportionate to their size. The problems begin with the material per se. If one fails to follow the narrow (but unfortunately not publicly known) tolerance limits for the mixture of ingredients, then soon after smelting one will face serious problems with fine adjustment or stability. Of course, one can always turn to Vakuumschmelze GmbH, a vacuum smelter in Hanau, Germany, which has specialized for several generations in the delicate process of manufacturing the Nivarox alloy. But – and here's the rub – this company only begins to manufacture the alloy after the customer that has commissioned the production provides the formula for the desired substance. Therefore, the customer must precisely define the composition of its desired Nivarox alloy. There's another problem, too: because of the mixing process, the minimum amount of material that can be processed is half a ton, from which Vakuumschmelze can produce about 350 kilograms of Nivarox wire. The price tag totals a bit more than half a million euros (about $650,000). Of course, that much wire is enough to manufacture about 280 million hairsprings. If the Swiss watchmaking industry continues to produce at its current annual rate, this would be enough little spiral springs to meet their needs for the next 40 years. This is not a viable alternative for small producers.

THE SWATCH GROUP'S REQUEST FOR A COMCO RULING ON WHETHER IT COULD CUT ITS HAIRSPRING SALES ROILED THE SWISS WATCH INDUSTRY.

The German company Carl Haas GmbH, Straumann's former partner in the development of Nivarox, owns so-called "batch numbers" for smelting at Vakuumschmelze. These numbers authorize the company to smelt alloy of its own in the specified qual-

Hairsprings are "baked" in this kiln at Precision Engineering.

ity whenever it so desires. However, Vakuumschmelze will have to wait a while before it receives its next commission from Carl Haas. "Our stockpile currently contains more than 80 kilograms of Nivarox wire in quality categories I and II. From each kilogram, we can deliver 800,000 hairsprings in any of five quality classes in accordance with our customers' requests," says Hannes Steim, junior head of the German Kern-Liebers Group, which owns Carl Haas. Yet Carl Haas can only dream about industrialization on the scale of Nivarox-FAR. "But, we're producing a significantly greater numbers of springs each year," Steim says.

Carl Haas began making Nivarox hairsprings in the 1930s. Forty years later, the quartz revolution put an end to mechanical watchmaking until its rebirth in the late 1980s. Down but not defeated, Haas retooled and revised its product portfolio to include return springs for automobile tachymeters, which are manufactured using the same basic technology used to make hairsprings.

In the meantime, Carl Haas had in 1970 acquired a hairspring production site in Portugal when it purchased a company called Spirel LDA. Portugal, however, wasn't the best location from which to supply components to the watchmaking industry, so in 2009 Carl Haas resumed manufacturing hairsprings in Schramberg, Germany. Some 300,000 of these little springs leave the factory annually, and each one is laser welded to its pre-supplied collet and balance. Carl Haas also makes hairsprings in chronometer quality, with Breguet terminal curves, and even some with a blue color that most Nivarox springs don't have. The company employs two veteran hairspring specialists aged 70 and 74. Just three employees oversee production. Because some Carl Haas customers prefer to buy Swiss-made springs, Steim has also formed a partnership with Precision Engineering AG, a sister company of H. Moser & Cie. based in Neuhausen, Switzerland.

Precision Engineering's CEO, Jürgen Lange, says that his company makes about 200,000 hairsprings each year. The company can completely recalculate and manufacture hairsprings on the basis of caliber data, technical drawings or actual samples.

Its hairsprings are available in different qualities. The least costly version is made of NiSpan-C, a corrosion-resistant, self-compensating, but not antimagnetic, material. Springs made of PE 3000 (Nivarox-CT), are of top quality and suitable for the escapements of COSC-certified chronometers.

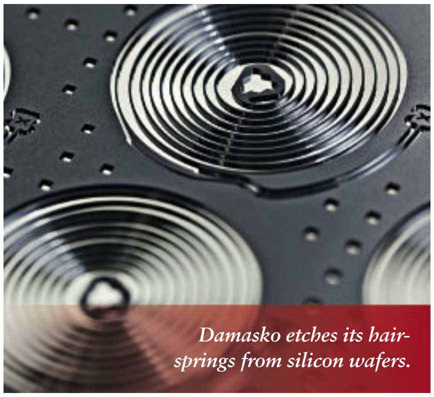
Precision Engineering is only able to make small series because it lacks the machines it needs for large-scale production. To get them, the company will need to find a business partner or partners, Lange says.

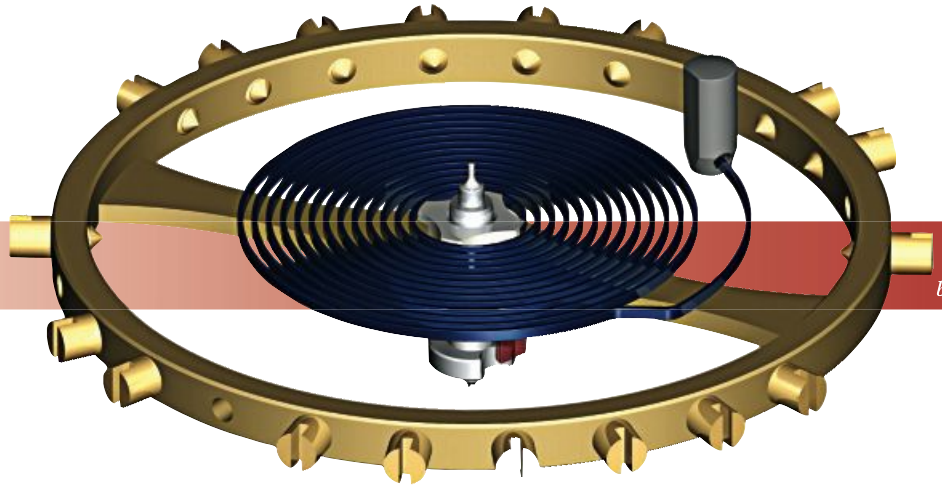
Silicon: Springing Up All Over

At the suggestion of watchmaker Ludwig Oechslin, the brains behind Ulysse Nardin's Trilogy of Time and many other of the brand's famous watches, the first prototypes of silicon hairsprings were made at the private research laboratory Centre Suisse d'Electronique et de Microtechnique (CSEM) in Neuchâtel in 2001. Silicon is a good material for hairsprings because it's lightweight, it's nearly unaffected by magnetic fields, and it can be easily and precisely shaped by industrial methods. However, silicon reacts relatively strongly to temperature fluctuations. A breakthrough came after Rolex, Patek Philippe and the Swatch Group formed an unusual alliance to finance the research to find a solution. Adding a layer of silicon oxide assured that temperature fluctuations would only very slightly alter the rate. In the manufacturing process, a large ingot is grown using the crystal-culturing method. Thin wafers like those used to manufacture semiconductor chips are cut from this ingot. Afterwards, the deep reactive etching process (DRIE) is used to create the desired shapes, which have very precise contours and extremely smooth surfaces.

Patek Philippe coined the word "Silinvar" for the material coated with silicon oxide. The Geneva-based company unveiled its first watch with a silicon hairspring in 2006, followed in 2008 by a model in which both the anchor and the escape wheel are made of Silinvar. Patek Philippe only uses this new technology for its limited-edition annual-calendar watches. In the meantime, the Swatch Group has equipped all new co-axial calibers from Omega with silicon hairsprings. This enables each of these movements to earn COSC certification and to be sold with a longer, four-year guarantee. Our tests have repeatedly found that these movements are very precise.

These three brands patented the use of mono-crystalline silicon for hairsprings, but poly-crystalline silicon may also be used for this application. The German watchmaker Konrad Damasko makes his patented hairsprings from this material and also coats them with silicon oxide. His company, Damasko, which is headquartered near Regensburg, has made watches with these hairsprings since 2010. Another advantage of silicon is that, unlike the strips of metal used for most hairsprings, silicon can be given any shape. The spring's inner point of attachment to the balance's staff and its outer attachment to the stud, both problematic in standard hairspring manufacturing, can be ideally contoured. The manufacturing process is much more expensive than that for making a Nivarox hairspring, but the extra cost is nearly insignificant for watches that sell for more than $5,000. It will be interesting to see who ultimately licenses the patent – because no silicon hairsprings can be legally manufactured without permission from the patent holder. ***– JENS KOCH***


Damasko etches its hairsprings from silicon wafers.



Each hairspring is attached at two points: its inner end is affixed to the balance's staff, its outer end to the stud.

THE QUESTION OF HOW TO OBTAIN HAIRSPRINGS IS VEXING MUCH OF THE SWISS WATCH INDUSTRY.

ASTRAL TECHNOLOGIE SA, in Porrentruy, Switzerland, part of the Festina Group, also makes hairsprings. Customers can't buy them separately, but must purchase complete assortments. Soprod, which is also part of the Festina Group, uses fairly large numbers of Astral's springs in its automatic caliber A10. The Festina Group is now determining whether it can develop the capacity to make 50,000 hairsprings at another subsidiary, MHVJ (Manufacture Horlogère Vallée de Joux) in Le Sentier, and even greater numbers at Soprod (in Les Reusilles).

The Swiss company Atokalpa makes escapements that are used in movements made by Vaucher Manufacture Fleurier and other companies. Vaucher and Atokalpa are both owned by the Sandoz Family Foundation (as is the Parmigiani watch brand). Atokalpa has long specialized in making gear trains, pinions and micro-gears for mechanical watches. It began making assortments in 2005.

Where some hairspring makers source their material is a closely guarded secret, but it's widely known that wholesalers offer the necessary wire in smaller quantities.

As far as prices are concerned, no one can compete with Nivarox-FAR. Customers report that hairsprings from Precision Engineering and Atokalpa are sometimes 10 times more expensive than comparable products from Nivarox-FAR. That's significantly more than the price of a complete ETA 2892 automatic movement or a SW 300, a so-called "clone" of the ETA 2892 made by the movement manufacturer Sellita. Haas hairsprings are also relatively expensive. Lower-priced merchandise can be purchased from Japanese producers: Seiko, for example, produces hairsprings, but most makers of Swiss movements have remained reluctant to use Japanese hairsprings. (TAG Heuer, however, announced in March that it would be buying Seiko assortments for use in its in-house movements because Nivarox had not renewed its contract with the company.)

The dilemma about how to obtain hairsprings is vexing much of the Swiss watch industry. Sellita, for instance, which depends on Nivarox escapements, filed an appeal of Comco's decision to allow this year's delivery cutbacks. (In May the decision was extended to include 2013 as well.) The company made about 500,000 movements in 2010, some 800,000 movements in 2011, and plans to produce about 1 million this year. "We're only receiving 85 percent as many Nivarox components as we received in 2010," says Sellita's owner, Miguel Garcia. He knows that the future of his business is at stake. "In the meantime, we've already taken so much money in hand that we can also plan the industrialized production of escapement assortments. But it will take a certain amount of time before that gets up and running."

At the moment, neither he nor anyone else will talk publicly about the possibility of cooperation between Sellita and Precision Engineering or Carl Haas. Whatever secret plans may be up Sellita's sleeve, one thing is certain: when you drive from La Chaux-de-Fonds to Le Locle, you'll see that Sellita is significantly enlarging its gray building in Le Crêt-du-Locle.

A few brands can make hairsprings to meet their own needs. One is Montblanc's subsidiary Minerva, in Villeret, Switzerland. Another is A. Lange & Söhne, in Glashütte, Germany, which has developed impressive hairspring expertise during the last several years. Lange's former chief, the savvy German businessman Günter Blümlein, who died in 2001, acquired the necessary machinery (which was thought to be superfluous at the time) and a portion of the still-available Nivarox material from hairspring specialist Carl Haas. A. Lange's hairsprings are used not just in its own watches but also by Jaeger-LeCoultre. (Both companies are owned by the Richemont Group.) Jaeger itself has made great strides in hairspring manufacturing: if necessary, it could start to operate independently in a relatively short time.

Geneva-based Rolex, which manufactures hundreds of thousands of COSC-certified chronometers, makes more hairsprings by far than any other watch brand. They're made of what Rolex calls "Parachrom," an alloy of niobium and zircon. This alloy resists magnetic fields, and hairsprings made from it are 10 times less susceptible to shocks than conventional hairsprings. But Rolex sells only complete watches; it doesn't sell its hairsprings.

Who will fill the hairspring void no one knows. If, as many observers expect, Comco rules in favor of the Swatch Group, watch companies will have to find their hairsprings elsewhere, or invest huge amounts of money in equipment to make their own. ○

SPEAK EASY

A guide to tongue-twisting watch-brand names

You say you can't figure out whether to say "hub-blot" or "hub-low" or "you-blot"? You say sales associates snicker when you ask to see a "bre-get"? You say your tongue hurts when you take a stab at saying Audemars Piguet? Is that what's bothering you, Bunky? Well, cheer up because with the help of our watch-brand pronunciation guide, you'll be nailing those names like a Genevan.

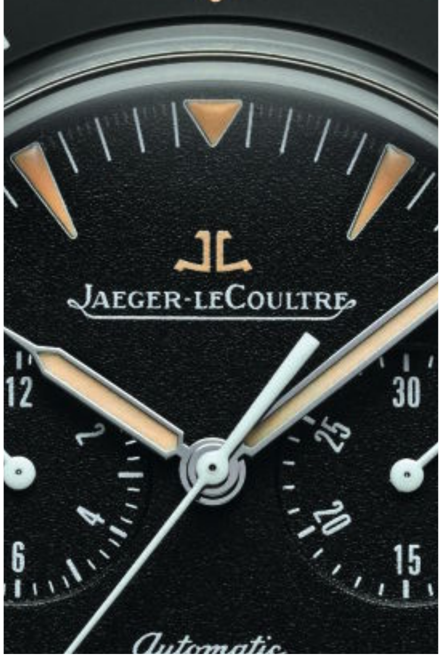
A. Lange & Söhne	ah LAHN guh und ZO nuh
Alpina	al PEE nuh
Armand Nicolet	are MAHND NIK o lay
Audemars Piguet	AWE duh mahr PEE gay
Baume & Mercier	BOHM and MURSE ee ay
Bédat	BAY dah
Blancpain	BLAHNK pan
Bovet	BO vay
Breguet	BREH gay
Breitling	BRITE ling
Bulgari	BUL guh ree
Carl F. Bucherer	Bucherer: BOO kur ur
Cartier	KAHR tee ay

ah LAHN guh und ZO nuh

AWE duh mahr PEE gay

BOHM and MURSE ee ay

glass HOO tuh or ig in AHL

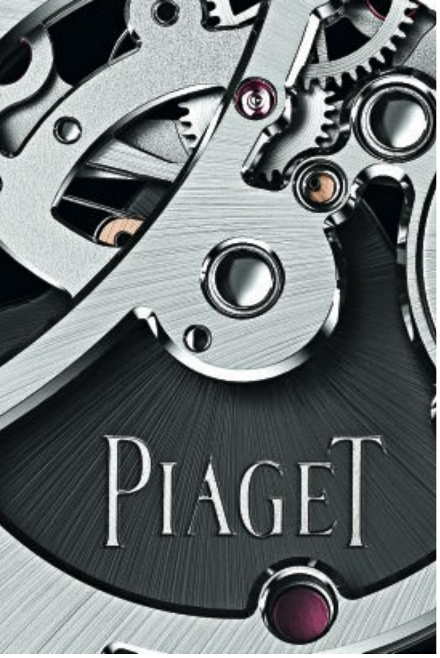


zhey ZHER leh KOOLT

REE shard MEEHL

ZHOCK ay DROH

Chopard	show PAHR
Christophe Claret	CRIS toff CLAIR ay
Cuervo y Sobrinos	KWER vo ee so BREE nohs
Custos	COO stohs
Cyma	SEE muh
Daniel Roth	Roth: ROTE
De Bethune	deh beh TOON
DeWitt	deh VITT
Doxa	DOX uh
Dubey & Schaldenbrand	due bay and SHALL den brand
Ebel	ee BELL
Favre-Leuba	FAHV LUBE uh
F.P. Journe	Journe: ZHORN (rhymes with “torn”)
Franck Muller	FRAHNK MYOU ler
Frédérique Constant	FRED ur eek con STAHNT
Gérald Genta	Genta: JEN tuh
Girard-Perregaux	zhee RAHRD PAIR uh go
Glashütte Original	glass HOO tuh or ig in AHL
Greubel Forsey	GROIB uhl FORCE ee
Hublot	U blow
Hysek	HEE sek
IWC Schaffhausen	SHAFF how zin
Jaeger-LeCoultre	zhey ZHER leh KOOLT
Jaquet Droz	ZHOCK ay DROH
Jean Dunand	ZHAHN due NAHND
JeanRichard	zhahn ree SHARD
Junghans	YOONG hans
Kari Voutilainen	KAHR ee VOU tuh LAY nehn
Kobold	KO bald
Limes	lee MEZ
Longines	LAWN jeen
Louis Moinet	loo ee mwah NAY
Louis Vuitton	lou ee vwee TAHN
Maurice Lacroix	Lacroix: LAH KWAH
Maximilian Büsser	max ih MIL yun BOO ser
Mido	MEE doe
Milus	MEE loos
Montblanc	MOHNT BLAHNK



pee ah ZHAY

you LEESE nahr DAN

VASH er ahn kon stan TAN

ZEH nith

Moser	MO zer
Movado	muh VAH doe
Mühle Glashütte	MEW luh glass HOO tuh
Nomos	NO mose
Officine Panerai	off ih CHEE nay PAN ur eye
Omega	o MAY guh
Parmigiani Fleurier	pahrm ih ZHAH nee FLUR ee ay
Patek Philippe	pah TEK fill EEP
Paul Picot	Picot: pih CO
Perrelet	PAIR eh lay
Peter Speake-Marin	PEE ter speek muh RIN
Philippe Dufour	phil LEEP due FOR
Piaget	pee ah ZHAY
Rado	RAH doe
Ralph Lauren	Lauren: LOR en
Richard Mille	REE shard MEEHL
Roger Dubuis	roe ZHER do BWEE
Seiko	SAY ko
Sinn	ZIN

TAG Heuer	TAG HOY ur
Tissot	TEE so
Tutima	TOO tih muh
Ulysse Nardin	you LEESE nahr DAN (The last syllable is spoken with a short, nasal "a" with no real equivalent in English. The "n" is not pronounced fully, but cut off in the back of the mouth as soon as it begins.)
Universal Genève	Genève: jeh NEV
Vacheron Constantin	VASH er ahn kon stan TAN (For last syllable, see note for "Ulysse Nardin.")
Van Cleef & Arpels	Arpels: ahr PELL
Victorinox	vick TOR ih nox
Vulcain	VULL CAN
Wenger	WEN ger
Wittnauer	WIT now ur
Xemex	ZEM ex
Zenith	ZEH nith

Just married! Alison Marli in her grandmother's vintage Tiffany diamond and platinum watch and Steve McNamee in a white gold DeWitt Academia Quantième Perpetual on their wedding day at the Four Seasons Resort in Scottsdale, Ariz.

David Brumbaugh sports his Gergé Metropolis Type M2 Limited Edition while taking in the view of the Coronado Bridge during a San Diego Padres game.

Chris Hicks with his newborn daughter Lillian Jewell Hicks and his Rolex GMT Master II in Raleigh, N.C.

Bryan Sakamoto sports his TAG Heuer Carrera on his visit to the Millau Viaduct in the south of France.

Gerardo Garcia and Gerardo Garcia, Jr., getting ready for take-off at Dallas/Fort Worth for a father-son vacation to Washington. Garcia wears his two-tone Rolex Submariner Ceramic with black dial; his son, his Swatch Body and Soul on leather strap.

Attending a conference in Washington, D.C., Mark Newman wears his Jaeger-LeCoultre Master Compressor Memovox.

Vladimir Zakursky, RPA-C, M.D., at work in the Cardiology Telemetry Unit, with his Cuervo y Sobrinos Robusto Chronograph Complete Calendar with tobacco brown dial

André De Man wears his Patek Philippe Aquanaut 5167A during a weeklong vacation at The Heritage Awali Golf & Spa Resort on Mauritius Island.

Bob Bruno, left, with his son, Wood Bruno, who has just been commissioned into the U.S. Navy at a ceremony at Duke University. The elder Bruno wears a two-tone Rolex Submariner with ceramic bezel; Wood Bruno wears his father's factory-restored Rolex 16610 from 1993.

To submit a photo, please send your image to **photo@watchtime.com** with a short description identifying each person in the photo and the watch each one is wearing. Please give the first and last name of the wearer and the brand and model of the watch. If the photo was taken at an event, please specify when and where it was held. Only clear images in which both the face of the watch and the wearer are visible will be considered for publication. Images must be in JPEG format, no smaller than 1 MB. Only the best-quality and most interesting photos will be considered. The chosen photos will also appear on *WatchTime*'s website and on Facebook, Twitter and Pinterest.

BY JOE THOMPSON

'Dining on a Volcano'

When you want the straight skinny, Johann Rupert is your go-to guy. Publicly, Rupert doesn't speak much. For most of the year, the executive chairman and CEO of the Richemont Group keeps a low profile. Once a year, however, in mid-May, he steps up to the microphone and, to borrow Howard Cosell's boast, "tells it like it is."

The occasion is the announcement of the final results of the group's fiscal year, when Richemont's three wise men (Rupert, deputy CEO Richard Lepeu and CFO Gary Saage) meet with financial analysts to discuss the figures. Invariably, Rupert steals the show with his blunt talk, his back-and-forth banter with the analysts (funny or prickly depending on the question) and his revealing remarks on a wide range of topics. For anyone interested in watches and/or finance, the session is a must-see (or must-read) event. (A video and transcript are available at richemont.com.)

"IF WE'RE WRONG [ON CHINA], IT WILL BE TOO GHASTLY TO CONTEMPLATE FOR ALL OF US."

JOHANN RUPERT

This year Rupert was in rare form. It was a surprise to learn that the man who ranks #199 on *Forbes*'s list of the world's wealthiest people sides with the little guy in the current round of rich-poor frictions. The session opened with him decrying the disappearance of reliable utility stocks – "a widow and orphans stock," as he put it – that people with modest means can invest in. "That's why I'm part of the 99 percent, not part of the 1 percent," Rupert said. "I actually think we've failed. We behaved morally reprehensibly in terms of what we're leaving for the next generation. Two years ago I told you we're going to have a tearing of the social fabric. We are going to have an emergence of a left wing and right wing, and the left wing and right wing are so scary that they're almost the same…."

On the watch side, he revealed that "the single most profitable venture" he ever did was purchase Panerai. "We paid less than $1 million, we found 40 pre-war Rolex movements, which we cleaned and oiled, we put into platinum [cases] and we sold for more than the purchase price." Adding to the satisfaction, no doubt, is that his brain trust in Europe advised the South African-born-and-raised Rupert against the deal. "My colleagues tell me that I am an Afrikaner with no taste, OK, so don't buy it. [That's] what they wrote to me: That I'm unsophisticated. I then wrote to them: 'But I have more shares, so we are buying it.'"

There are always a few useful, homespun management tips from the head of the world's second-largest luxury-goods group. Like this one: "I think every manager's goal, really, is to make a company idiot-proof, because sooner or later an idiot will run the company." Or this one: "I think if you want to be successful, you need a very healthy dose of paranoia, that somewhere every day somebody's there that wants to eat your breakfast, and if you're not there, they will do so…. That's why I love Ralph Lauren so much. We're actually not quite sure who is more paranoid, him or me. When we sit down and we start talking about what could go wrong, this goes into the early morning."

What keeps Rupert up nights lately is China. Richemont reported record sales (€8.87 billion) and profits (€1.54 billion) in the fiscal year ended March 31 and China is the main reason. (See our report on page 30.) But Rupert is nervous. Although his colleagues begged him not to say in public what he's told them in private, he did: "I feel like I'm having a black-tie dinner on top of a volcano. That volcano is China, but that's what it feels like. In the morning we put on our ties and our watches and we go, and the food's better, and the wine's better, and the weather is great, but let's not kid ourselves. There is a volcano somewhere, whether it's this year, in 10 years' time, or in 20 years' time. We are exposed to China…. We are now a 'China play.' It's everything that I would never have thought 10 years ago, but that really is our business. Personally, I don't think anything's going to go wrong in China. That's my view, but I know nothing. I may be too optimistic about China…. But I've got to give you a counterbalance that if I am wrong on China, we're going to have issues.

"What's happening for us [Richemont] in China is good news, but understand that if we're wrong, it will have implications. But, by the way, it will be too ghastly to contemplate for all of us, because, believe me, it will be every single large company."

Rupert's penchant for saying what he thinks so clearly and colorfully can cause consternation within Richemont. For the rest of us, though, he's a breath of fresh air. ○

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